FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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EDITORIAL COMMENT.

IN our issue of the 5th of April last, we commented in strong terms on the ukase of the Ministry of Munitions, prohibiting not only the actual construction of aircraft, but even the preparation of working drawings, except under licence of the Ministry. We said then that if the Order meant anything at all, it meant that it was the intention of the Ministry to stop all private research and experiment, placing thereby the firms and individuals at present engaged in the aircraft industry in the position of mere hirelings of the Department, and thus creating a monopoly for the Government-designed machine. True, in connection with the Order there was an express disclaimer of any such intention. It was stated that "the Order is not designed to prevent and discourage the design of new machines, but only to prevent useless expenditure of labour and materials upon designs and machines which have no prospect of success. The Department desires to give every possible encouragement to original design, and no obstacle will be placed in the way of any persons when there is a reasonable likelihood of their being able to produce a useful design."

The Ministry of Munitions and a Monopoly.

What we said about this disclaimer was as follows:

"If that is so, then the Order appears to be entirely superfluous. Moreover, who is to be the judge of whether designs or machines 'have no prospect of success'? As it stands the Order is open to the construction that henceforth such firms as the Sopwith, the Avro, the Short, the Bristol and a score of others who have rendered inestimable service to the cause of aviation and have helped immeasurably in the development of the modern aeroplane, are to have a period put to their valuable experimental work. Everything is to stagnate at the bidding of a Government Department which has it in its power to create a monopoly of design. It is true that the terms of the Order leave it open to the Ministry to grant licences to all or any of these firms to carry out experimental work, but a long acquaintance with departmental manners and customs has made us very sceptical of the intentions of officialdom when it sets out to arrogate to itself powers like those assumed by the Ministry of Munitions under the Order in question. There is always some *arrière pensée* in these matters, and the more we regard this present example the less we like it. Unless it is the intention of the Ministry to create the monopoly we suggest, where lies the necessity for the restriction?"

From various items of information that have reached us, we have every reason to believe that the effect of the Order in question has been precisely what we predicted it would be. Research and experiment of a practical nature has been virtually brought to a standstill, and the official fiat has gone forth that nothing in the way of unofficial design can possibly have good in it. Naturally, it is impossible for us to give chapter and verse of the complaints that have reached us regarding the operation of the Order, though we doubt not that when the time comes for the enquiry which seems inevitable a great deal more will emerge than is possible under present circumstances. When that does happen, we venture to predict that things will be made rather uncomfortable for the people who are at the present time filling the *role* of obstructionists to progress. For that appears to be what is happening—certain officials have constituted themselves the arbitrary judges of what is and what is not likely to eventuate into a "useful design," and their view apparently is that nothing that does not emanate from official quarters can by the remotest possibility possess any merit. We fully realise how immensely important rapid production of really good machines is, but we do maintain that rapid production should go hand in hand with progress. To follow the policy of waiting until the enemy has produced something better than our best, and then to endeavour to go one slightly better is entirely wrong, though that is the net effect of stifling private experiment. Does Lord Cowdray, we wonder,

realise what is going on? And if he does, is he doing anything about it?

* * *

"The War and the Air."

In a recent issue of the *Daily News*, Mr. Arnold Bennett has a long article dealing with this subject. So far as it is possible to discern, the two main objects of the article are, first, to show that the war can and may be won in the air, and, second, to back Mr. Winston Churchill for the presidency of the Air Board. We are entirely in agreement with the first proposition, and in qualified agreement with the second, as the readers of "FLIGHT" are aware. We like Mr. Bennett's outspoken remarks on the divided counsels which are tearing at the vitals of our war machine. He says:—

"At this moment, when arrangements might be made for winning the war in the air, military leaders are divided into two camps, not the pro-aviation camp and the pro-land camp, but the pro-cavalry camp and the pro-Tank camp! And the adherents of cavalry form a very powerful group indeed. I know nothing about military science, but I am ready, arguing from general principles, to stake everything on the assertion that 99 per cent. of all the energy, brains and money spent on cavalry in this war is and will be utterly wasted. And as regards Tanks, though I believe in them, I am convinced that energy, brains and money might be far more advantageously spent on aeroplanes than on Tanks. The one factor that justifies Tanks is the rank unimaginative stupidity of the enemy. If Germany had imagination she would concentrate in the air for the remainder of the war. She may yet do so. She has every encouragement to do so. If she did, we should be compelled painfully to follow her and catch her up—if we could."

That is all very true, but the writer might have added to it. In another column we have directed attention to the virtual suppression of private enterprise in the matter of aeroplane design, which has a very distinct bearing on the wide question of aerial supremacy. Undoubtedly, the war *can* be won in the air, but only if we take the very fullest advantage of the whole of our resources, moral as well as material. We must devote all the best constructive brains of the country to the task, as well as mobilising our factories. The latter we have done, and done well. The former we have neglected and stultified at the instance of hide-bound officials and people with axes to grind.

* * *

The Aerial Age.

Lord Montagu's paper, read last week before the Aeronautical Society, was an exceedingly interesting contribution to the literature of the air. In general, the author followed very much the same lines as those pursued by Mr. Holt Thomas in a recent paper, though he added a great deal of interesting matter relative to organisation and control of the aerial services of the future. The complete text of the paper will be found in another part of this issue of "FLIGHT," so there is no need for us to quote extensively from it here. There is the less need, inasmuch as the principal interest lay in the light it shed on the possibilities of the future rather than in anything new that Lord Montagu had to tell his audience about the present. Not so long ago, the paper would have been pronounced a flight of imagination and its author either a lunatic or a clever romancer. But times have altered, and nothing is more eloquent of the change than to find so sober a journal as the *Daily Telegraph* accepting at its face valuation practically the whole of Lord Montagu's prophecy. In a leading article, the *Telegraph* says:—

"His address will not be dismissed by any sensible person as a flight of fancy. He dealt with developments which are so near our experience that even our prosaic Government has appointed a Committee to consider them. It took many years for the steam engine to triumph. All the conservative forces fought against it, the Admiralty being particularly determined not to countenance the steam-driven man-of-war, for it seemed to them to mean the end of everything we cherished. The pioneers, who spoke of a speed on land of 30 miles an hour and of travel by sea at a steady 15 knots, were regarded as madmen. We have learnt our lesson, it may be hoped, and are in the mood to welcome the new age of aerial navigation. It is coming, whatever our attitude may be towards it, and, as Lord Montagu pointed out, we have every reason to encourage the development, because, owing to the distribution and configuration of the British Empire, we are very favourably situated. We can make our world-wide plans without the by-your-leave of any other nations, since we possess a chain of landing places, southward and eastward, from Gibraltar towards the Cape, to Egypt, India and Australasia; while the nearest points between the North American Continent and Europe, the West Coast of Ireland and the East Coast of Newfoundland, are both within the Empire. . . . Such an evolution, as Lord Montagu suggests, may seem very unreal to persons of a conservative bent of mind, but those among us—and they are not few—who have seen the advent of the locomotive, the marine steam engine, the electric telegraph, the telephone, the submarine cable, the motor car, and wireless telegraphy and telephony, may perhaps wonder that this newest revolution has been so long delayed. The solid fact is that the internal combustion engine, of light weight and high speed, began a development the ultimate character of which it is even to-day impossible to foresee."

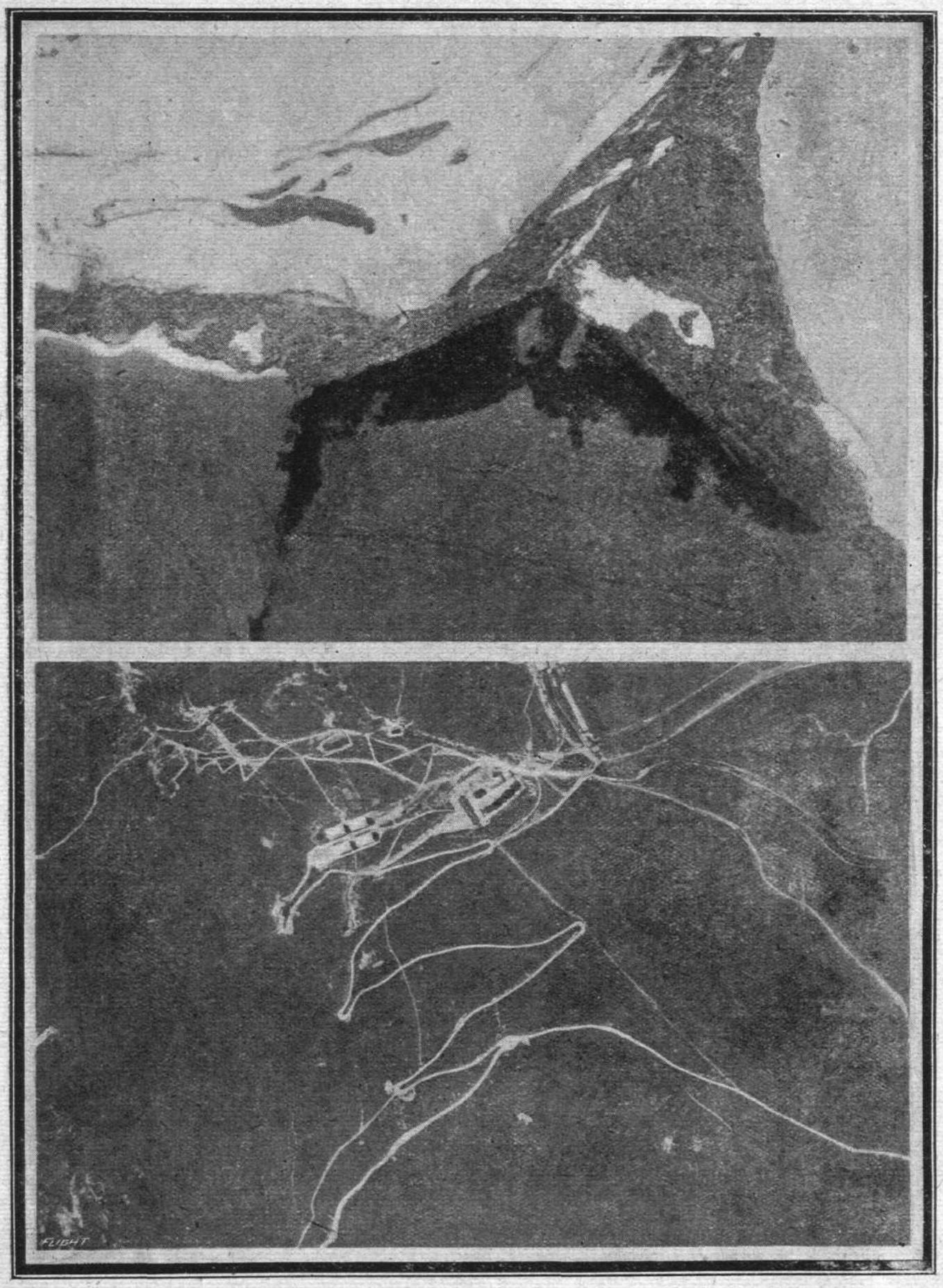
There is little we can add to this, except that even to those of us who have been closely associated with the development of aviation since its earliest days, it seems passing wonderful to find how soberly and calmly people accept the possibilities nowadays. It is a far cry from the time when Lord Northcliffe was lampooned on account of his offer of a £10,000 prize for a flight from London to Manchester!

* * *

"Reprisals."

Mr. Coulson Kernahan does not like the use of the word "reprisals." He prefers that we should talk of "defensive deterrent acts" when we speak of carrying out counter-raids on German towns and cities. So far as we are concerned, we do not mind by what name they are called, so long as they are undertaken and persisted in until the enemy has been driven to make the admission that the game he has elected to play is not worth the candle. We are not at all inclined to haggle about definitions in such matters, but if the suggested alteration will satisfy the Primate and those others who apparently think we should take these raids lying down, we are perfectly willing to adopt it, and to promise that never again will we make use of the objectionable term.

In the meantime, we have been free from raids since London was bombed in the middle of a summer forenoon and all the enemy machines succeeded in regaining their bases without loss. Let there be no mistake, however. It need not be imagined that the Hun has been so horror-stricken at the tale of murder done that he has given up his evil practices. On the contrary, the whole of the German press—with the one notable exception of a journal which has been suppressed for its sins—has indulged in transports of joy over the success of the enterprise. We may, therefore, be very certain that we shall be subjected to further visitations of the same kind, possibly even before these lines appear in print. And, so far, in spite of the universal indignation created and the strong demand for counter-measures, the Government has not told us its views. Questioned in the House the other day, Mr. Bonar Law was distinctly



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FROM "THE WAR IN ITALY."—Top: View of a mountain summit seen from above. Below: View of a new mountain road and hutments built by the enemy.

non-committal in his answers, and, reading between the lines, it is apparent that he at least is not in favour of "defensive deterrent acts."

In this matter of reprisals—we cannot help the use of the word—we fully recognise that military considerations must be paramount, and that any action which does not produce favourable military effect is a waste of energies which might be better applied to more useful purpose. If, for example, the policy of reprisals did not result in the stopping of raids on this country and in the detachment of a large proportion of enemy aircraft from the fighting front for home defence, that policy would not be justified. It seems to us that the Government and the military authorities have too easily arrived at the conclusion that such a policy would fail in its designed effect. As a matter of fact, they appear to argue from the same mistaken premises as the Hun apostles of frightfulness, whose views we summarised in our issue of last week. That is to say, they know from a deep knowledge of the psychology of our own people, backed by experience of their behaviour during and after enemy raids, that "frightfulness" does not impress the British character. From that it is an easy step to the assumption that the policy would be equally ineffective in the case of the Germans. That, we believe, is an entirely mistaken view. We know that the mere threat of reprisals has been enough to cause an attack of nerves all through those districts of Germany open to attack. That much emerges from their own Press, and it is a fair thing to assume that the actuality would, in fact, produce all the effect required. Besides, there is the ultimate argument that we have not tried it, and until we do we cannot say whether or not the policy would succeed. As we have said, the question is a purely military one, but at the same time we submit that it is one on which the mere civilian student has a perfect right, under existing circumstances, to express an opinion.

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The Scandal of the Unfit.

It is high time that something was done to mitigate the scandal of the drafting into the Army of men who are totally unfit to stand the strain of active training. Many thousands of these men have been taken away from their civil occupations, in many cases their businesses ruined, and then, after two or three months' training with all the attendant expense to the country, have been invalided out of the Service broken men—broken both in health and in pocket. The country is at a double loss in these cases, for not only is there the actual cost of the few weeks' service to be met, but there has also to be reckoned with the loss of the man's earning power, not only while he is actually in the Army but after he has left it, with the handicap of ruined physique and health. Admitted that it is not always possible for the most careful medical examination to disclose latent defects of the subject, which later manifest themselves under the strain of severe training, there is no doubt at all that in too many cases doctors are, to put it quite mildly grossly careless in their classification of men called up for military service. When we read of batches of men being examined and passed into the Army at the rate of about one per minute, the conclusion is unavoidable that the medical examination must be of the most perfunctory character, and that the system which permits the abuse is altogether wrong. It is not easy to say how the abuse should be remedied. One way in which improvement might be made is to place more personal responsibility on the examining doctors. Under the existing system, the doctor apparently has no responsibility at all, further than that imposed by his own professional conscience. We seriously suggest that in all cases where the recruit breaks down under training he should be examined by a competent medical board with a view to finding out whether his breakdown has resulted from causes which ought to have been apparent to a careful practitioner when the man was drafted into the Army. If it is found that it is, then let the examining doctor or doctors take the responsibility and mulct them in a penalty.

There could be no possible injustice in such a system, since no penalty would be incurred except in cases where default or gross carelessness is apparent. Moreover, it would certainly help to make the medical men who rush these poor devils into the Army, with often no examination at all to speak of, a little more careful. The absolutely callous manner in which many of these "doctors" conduct examinations which often mean all the difference between life and death to those most concerned is enough to make one's blood run cold. Further than that, there is the question of the utter waste of public money involved, which is appalling. However the system is to be altered, altered it must be, and the country looks to the responsible authorities to make the change without delay. We are prepared to make every reasonable sacrifice to win the war, but the wanton waste of money and men which this carelessness is causing is altogether useless and unnecessary.

We are to have, at last, a Parliamentary Committee to enquire into the whole of this matter, and into that of recalling men who have already "done their bit," and been invalided out of the Services before the "indispensables" of military age have been taken. That is certainly a step in the right direction, but what we should have liked would have been some assurance that in the meantime something would be done to arrest the scandal, which has assumed huge proportions, and has been productive of serious discontent among the people. There is no want of patriotism in this discontent. The war is costing the nation something like eight millions a day and there is a very uneasy feeling abroad that a great proportion is being utterly wasted, and for that waste the insane methods of the War Office in relation to the unfit is very much to blame. There is a double significance here, if only the bureaucrats were able to grasp it. Not only is every unfit man taken into the Army a direct charge on the country, without any corresponding advantage to the latter, but he is at least a potential taxpayer, if not an actual one, who is rendered incapable of paying his share towards those eight millions. It might have been thought that this aspect of the matter would have exercised some amount of influence on the War Office, but the question of how the war is to be paid for does not seem to enter into their calculations. Nor does it emerge that the terms of reference of the Parliamentary Committee include this rather vital aspect. However, public opinion has been thoroughly aroused, and we are to have an enquiry. So much is to the good, and it now remains to be seen what the result is going to be.

FLIGHT

HONOURS.

Honours for the R.N.A.S.

IT was announced on June 22nd that the King has been graciously pleased to give orders for the following appointments to the Distinguished Service Order :—

Flt.-Lt. C. J. GALPIN, R.N.A.S.

Flt.-Lt. H. G. BRACKLEY, D.S.C., R.N.A.S.—In recognition of his services on the morning of April 14th, 1917, when he carried out a raid on Bruges Harbour with good results in spite of difficult conditions. Great credit is due to him for his persistence and determination. He also dropped bombs on Ostend seaplane base on the night of May 3rd–4th, 1917, making two trips.

The King has been graciously pleased to approve of the award of the Distinguished Service Cross to the following officers :—

Flt.-Comdr. P. L. HOLMES, R.N.A.S.

Flt. Sub-Lt. (now Actg. Flt.-Comdr.) H. G. TRAVERS, R.N.A.S.—In recognition of his services with the Army in France. This officer has himself brought down three hostile aeroplanes completely out of control, and has taken part in two other combats in which enemy machines were forced to land in our lines. He has always shown the greatest determination in leading his flight on offensive patrols, and has on many occasions driven down superior numbers of hostile machines.

Flt.-Lt. E. J. COOPER, R.N.A.S.

Flt. Sub-Lt. C. R. MORRISH, R.N.A.S.

Flt. Sub-Lt. H. G. BOSWELL, R.N.A.S.

Flt.-Lieut. C. L. SCOTT, R.N.A.S.

Flt.-Lt. W. T. S. WILLIAMS, R.N.A.S.

Flt.-Lt. T. G. CULLING, R.N.A.S.—In recognition of his services on April 23rd, when with two other machines he engaged a formation of nine hostile scouts and two-seater machines. Two two-seater machines were shot down, one of them by Flt.-Lt. Culling unassisted.

Flt.-Lt. F. D. CASEY, R.N.A.S.—For conspicuous bravery and skill in attacking hostile aircraft on numerous occasions. On April 21st he attacked a hostile two-seater machine at a range varying from 40 to 100 yards, and brought it down completely out of control. On April 23rd on four different occasions during one fight he attacked hostile machines, one of which was driven down in a spining nose dive, and another turning over on its side went down completely out of control. This officer has driven down four machines completely out of control, and forced many others down.

Flt.-Lt. C. A. MAITLAND-HERIOT, R.N.A.S.

Flt. Sub-Lt. J. R. S. DEVLIN, R.N.A.S.

Sub-Lt. R. FORBES-BENTLEY, R.N.V.R.

In recognition of their services in a bombing attack on the Kuleli Burgas Bridge on January 4th, when several direct hits were scored and considerable damage done. The machines were exposed to anti-aircraft, rifle and machine gun fire during the attack, and also on the return journey.

Flt. Sub-Lt. L. P. PAINE, R.N.A.S.

Flt. Sub-Lt. R. LECKIE, R.N.A.S.

Flt. Sub-Lt. B. D. HOBBS, R.N.A.S.

Flt. Sub-Lt. C. MCNICOLL, R.N.A.S.

Flt. Sub-Lt. V. E. SIEVEKING, R.N.A.S.—In recognition of his services on the night of May 3rd–4th, when he dropped bombs on Ostend seaplane base with good results, making two trips.

Flt. Sub-Lt. H. T. MELLINGS, R.N.A.S.—In recognition of his services on March 19th, when he attacked a hostile aeroplane with great gallantry at heights varying from 12,000 to 2,000 ft.

Flt. Sub-Lt. F. E. FRASER, R.N.A.S.

Flt.-Lt. (Actg. Flt.-Comdr.) C. D. BOOKER.—For special gallantry in the field on numerous occasions, especially the following: On April 26th he went to the assistance of some of our photographic machines, which were about to be attacked by 12 Albatros scouts. One of these he fired on at close range, and brought it down out of control. On May 24th, whilst on patrol, he went to the assistance of a formation of our machines which was being attacked by nine hostile scouts. He attacked one of the latter, which was driven down in flames and crashed. Later in the same day he attacked and drove down out of control another hostile machine. On numerous other occasions he has attacked enemy machines, and driven them down out of control.

Flt.-Lt. G. G. SIMPSON.—For gallantry and able leadership in aerial fighting, notably on the following occasions: On May 3rd he drove down a hostile aeroplane out of control. On May 11th, while on offensive patrol with five other machines, he attacked six hostile aircraft. One of these he brought down out of control, and a few minutes later he attacked another at close range and brought it down in flames. On May 23rd he led a formation of five machines to attack at least twice that number of hostile aeroplanes. Both formations became split up, and a general fight ensued. Five times during the combat he drove off hostile aeroplanes from another of our machines, and one of those which he attacked was seen to go down in a spin.

The following officers have been awarded a bar to the Distinguished Service Cross for subsequent acts of gallantry :—

Flt.-Comdr. T. D. HALLAM, D.S.C., R.N.AS.. (D.S.C. announced in *Gazette* of December 15th, 1915).

Flt.-Comdr. R. S. DALLAS, D.S.C., R.N.A.S.—In recognition of his services on April 23rd, when with two other machines he engaged a formation of nine hostile scouts and two-seater machines. Two two-seater machines were shot down, one of them by Flt.-Comdr. Dallas unassisted. (D.S.C. announced in *Gazette* of September 6th, 1916.)

Flt.-Lt. C. L. SCOTT, D.S.C., R.N.A.S.

Flt.-Lt. R. A. LITTLE, D.S.C., R.N.A.S.—For exceptional daring and skill in aerial fighting on many occasions, of which the following are examples: On April 28th he destroyed an Aviatik; on April 29th he shot down a hostile scout, which crashed. On April 30th, with three other machines, he went up after hostile machines and saw a big fight going on between fighter escorts and hostile aircraft. Flt.-Lt. Little attacked one at 50 yards' range, and brought it down out of control. A few minutes later he attacked a red scout with a larger machine than the rest. This machine was handled with great skill, but by clever manœuvring Flt.-Lt. Little got into a good position and shot it down out of control. (D.S.C. announced in *Gazette* of February 16th, 1917.)

The following awards have also been approved :—

Distinguished Service Medal.

O.N. F 13351 Actg. 1st Cl. Air-Mech. F. BATE, O.N. F 19901 2nd Cl. Air-Mech. A. G. FLOWERS, O.N. J 2348 (Dev.) 3rd Cl. P.O. Mech. J. W. ROSE, O.N. F 9008 1st Cl. Air-Mech. G. B. CLEMENTS, O.N. F 9281 2nd Cl. Air-Mech. J. R. LAYCOCK, O.N. 238581 (Ch.) C.P.O., 3rd Cl., V. F. WHATLING, O.N. F 9088 1st Cl. Air-Mech. D. G. RENNETT, O.N. F 10364 2nd Cl. Air-Mech. C. S. LAYCOCK.

The following officers and men have been mentioned in Despatches :—

Sqdn.-Comdr. J. R. W. SMYTH-PIGOTT, D.S.O., R.N.; Flt.-Comdr. T. D. HALLAM, D.S.C., R.N.A.S.; Flt. Sub-Lt. J. R. ROSS, R.N.A.S.; Mid. E. R. SNOW, R.N. (since killed); O.N. F 8633 1st Cl. Air-Mech. W. T. HOLLIDGE (since died of injuries).

Wounded Soldier's Gallantry.

IN recognition of his gallant attempt to rescue two aviators who fell into the sea at Folkestone early in the year, Driver Albert Dalby, A.S.C., has been awarded the Royal Humane Society's certificate.

Although he was a hospital patient and had gone 78 hours without solid food, he ran down 200 steps and swam out some distance before being overtaken by a boat which reached the aviators earlier than he did. Dalby has also received a presentation by subscription.

Bessarabia to Macedonia.

A MESSAGE from Salonica on June 19th states that a Russian aviator recently arrived at that place, having flown from Bessarabia to the British Macedonian front (about 400 miles) in seven hours.

Sir Douglas Haig's Despatch.

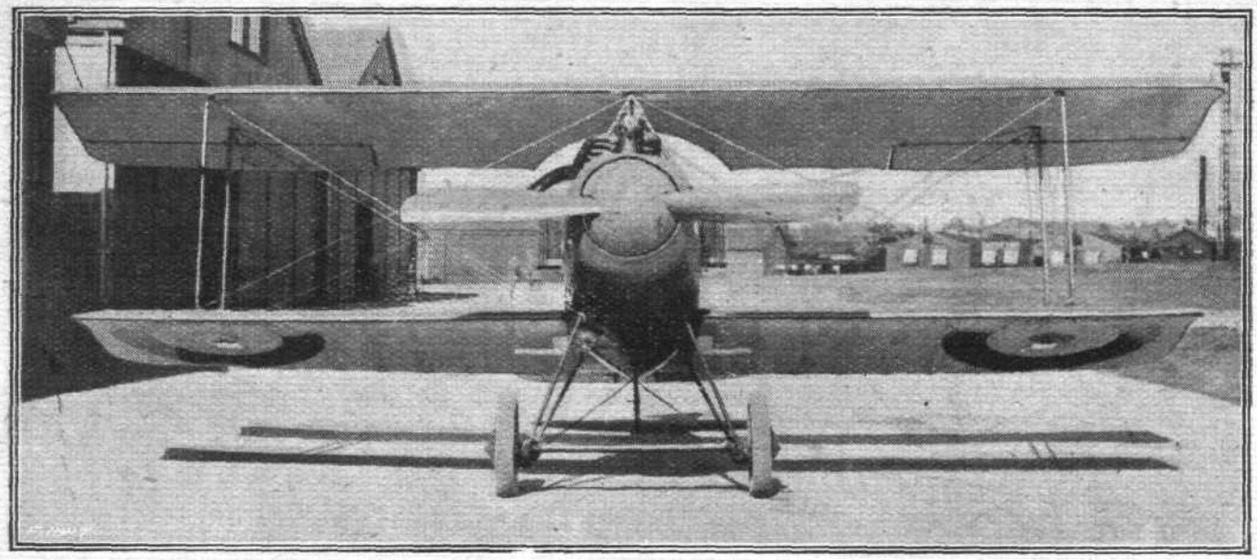
IN his despatch, dated May 31st and covering the period from November 18th, Sir Douglas Haig only makes two specific references to aircraft work.

In his notes on the month's fighting, which ended in the taking of the Beaumont Hamel Spur, he says the excellence of our artillery preparation and barrages "were made possible by the opportunities for accurate observation afforded by the high ground north of Thiepval, and by the fine work done by our aircraft."

Referring to the evacuation of the enemy of his line from Gueudecourt to Serre in February, Sir Douglas Haig says: "He (the enemy) was also materially assisted by a succession of misty days, which greatly interfered with the work of our aeroplanes."

THE ALBATROS D.1 "CHASER" BIPLANE.

PERHAPS one of the most formidable of the various types of Hun machines our pilots have been "up against" has been the Albatros "Bu" chaser scout. Although, being comparatively heavy, it cannot claim the high speed and other performance qualities possessed by the "star" machines of the Allies, it has, nevertheless, proved itself a good fighter, and one that is decidedly handy on the control.

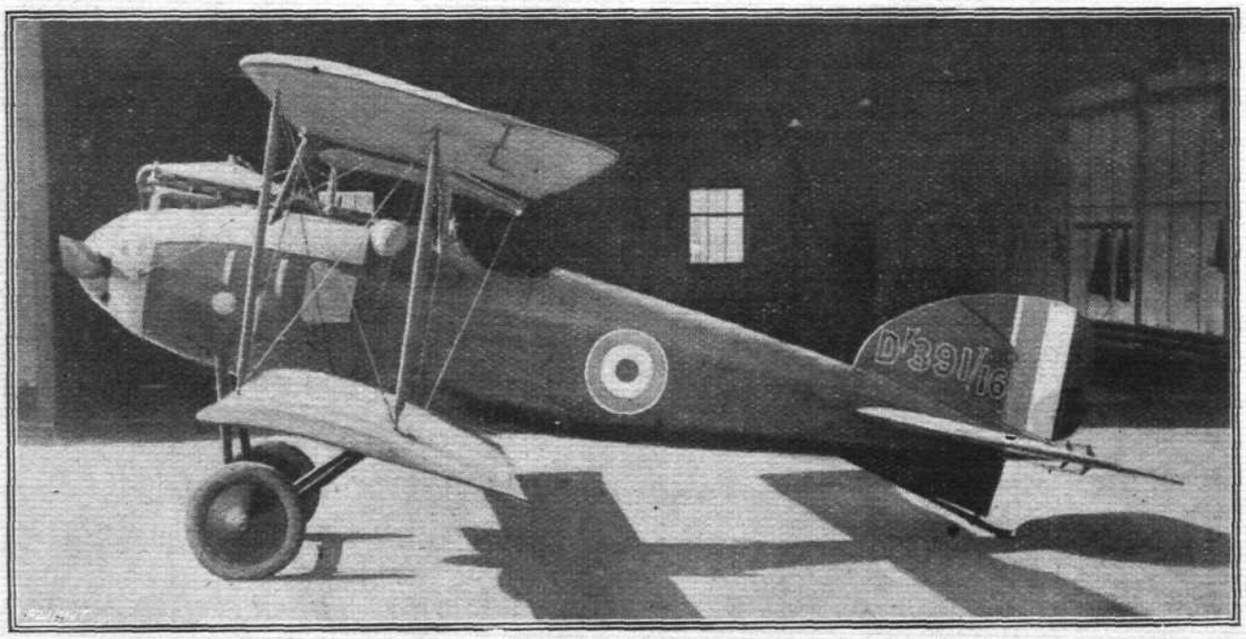


THE ALBATROS D. 1.—View from the front.

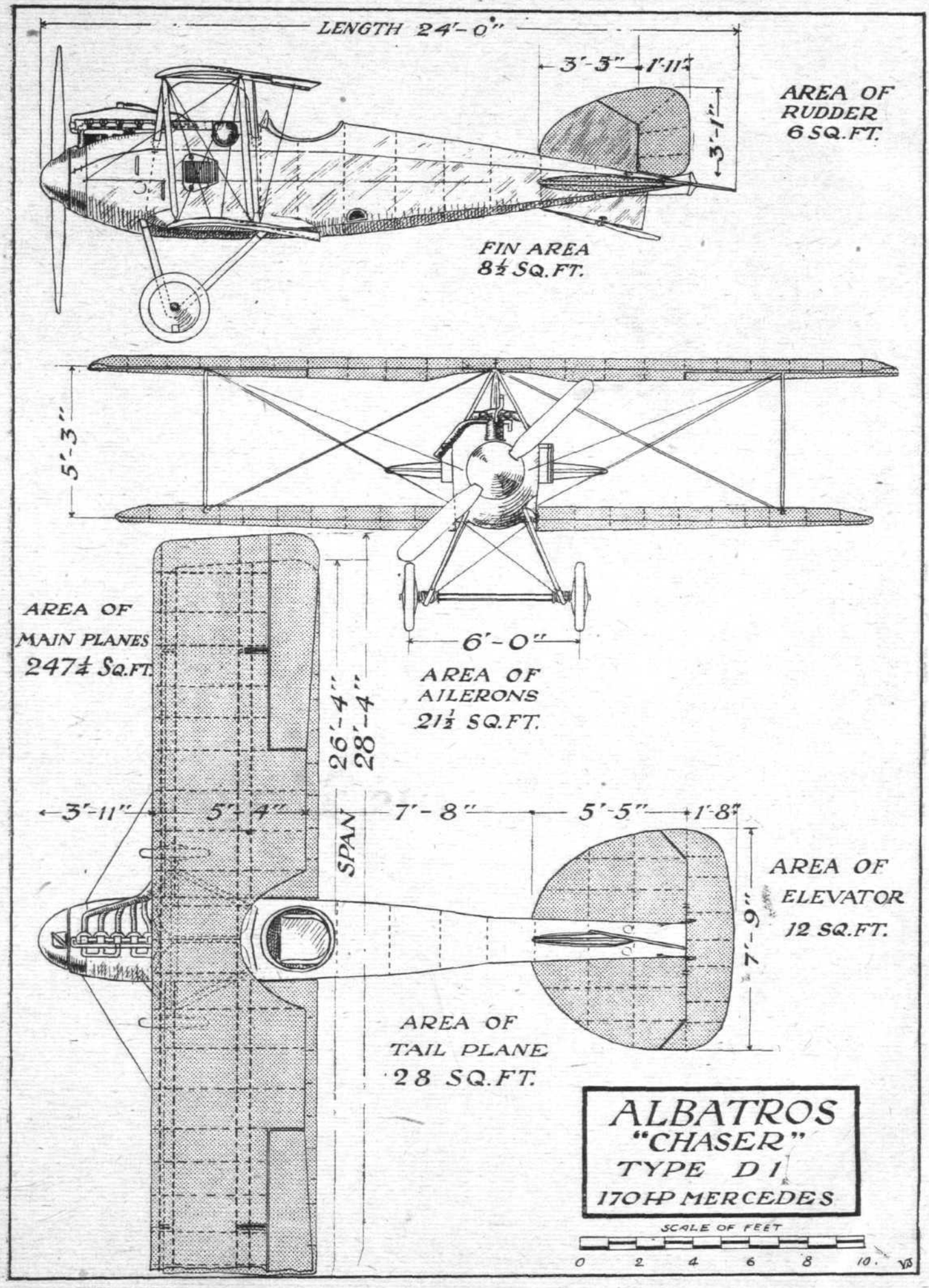
Through the courtesy of our authorities we have been able to make a thorough examination of one of these scouts—D. 1/391, 1916, No. 2944, brought down some six months ago on the British front—which has enabled us to add from personal inspection yet another detailed description of an enemy machine to those that have already appeared in "FLIGHT."

Having examined the Albatros "D. 1," it must be admitted that one could not but help admiring its general design and construction. Simplicity and strength formed the keynote throughout, complicated fittings and highly-finished parts being conspicuous by their absence. The "D. 1" bears signs of previous Albatros practice in several instances, mostly in a modified form, but there are also some radical innovations. Perhaps the most noticeable features consist of the monocoque *fuselage*—which is built up entirely of wood without any wire bracing—and the arrangement of the planes.

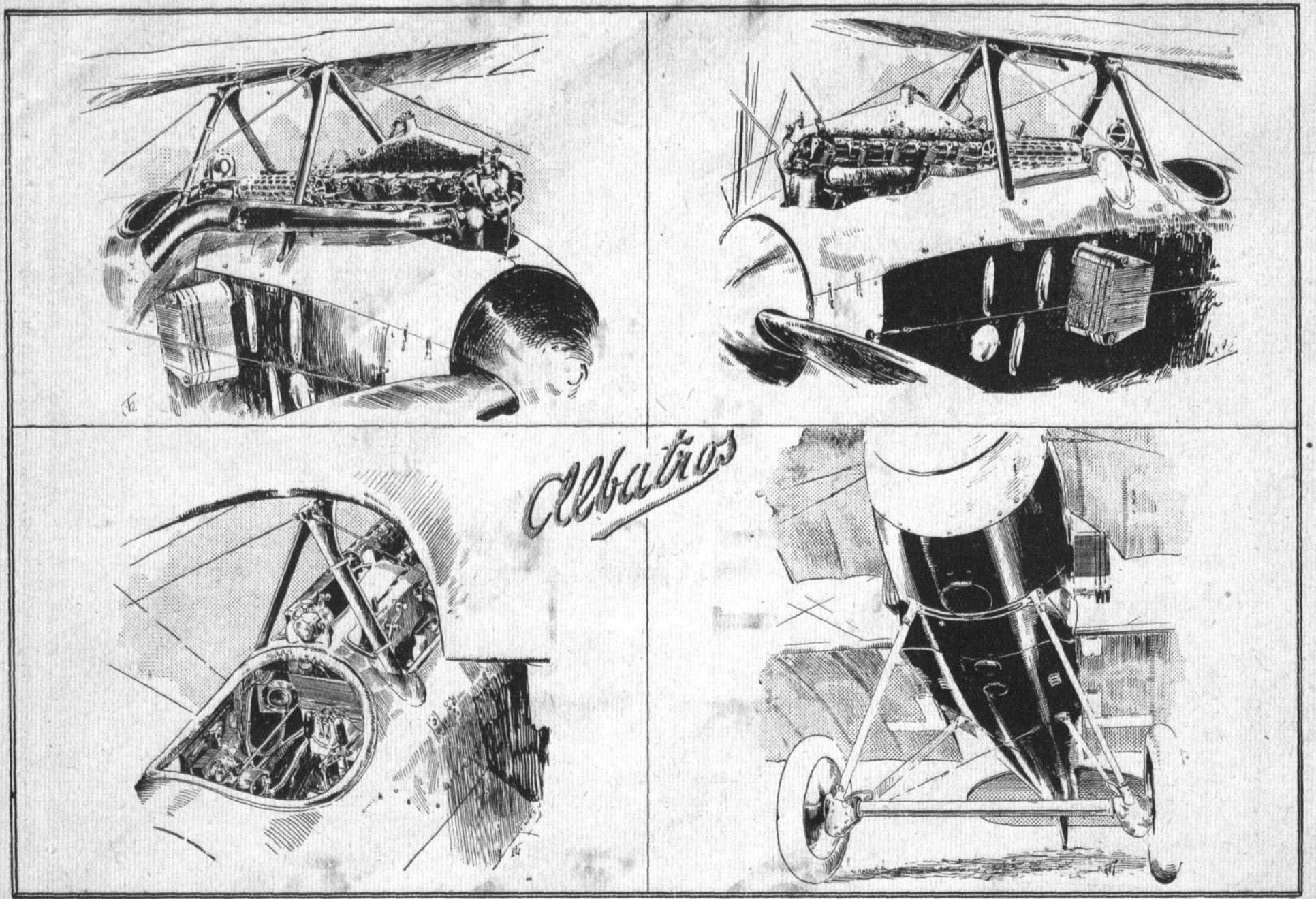
The latter, contrary to Hun practice, have neither sweep-back nor dihedral—the top plane, in fact, being one complete unit. The wing curve is similar to the Albatros "C. III," but having a flatter camber, whilst the angle of incidence varies from 5° 3′ at the centre to 4° and 2° at the left and right hand wing-tips respectively. A somewhat novel feature consists of the method of adjusting the stagger of the top plane from 0 to 12 cm., by moving it along the top of the *cabane*. This is effected in the following manner: In each end of the top horizontal tube of the *cabane* is



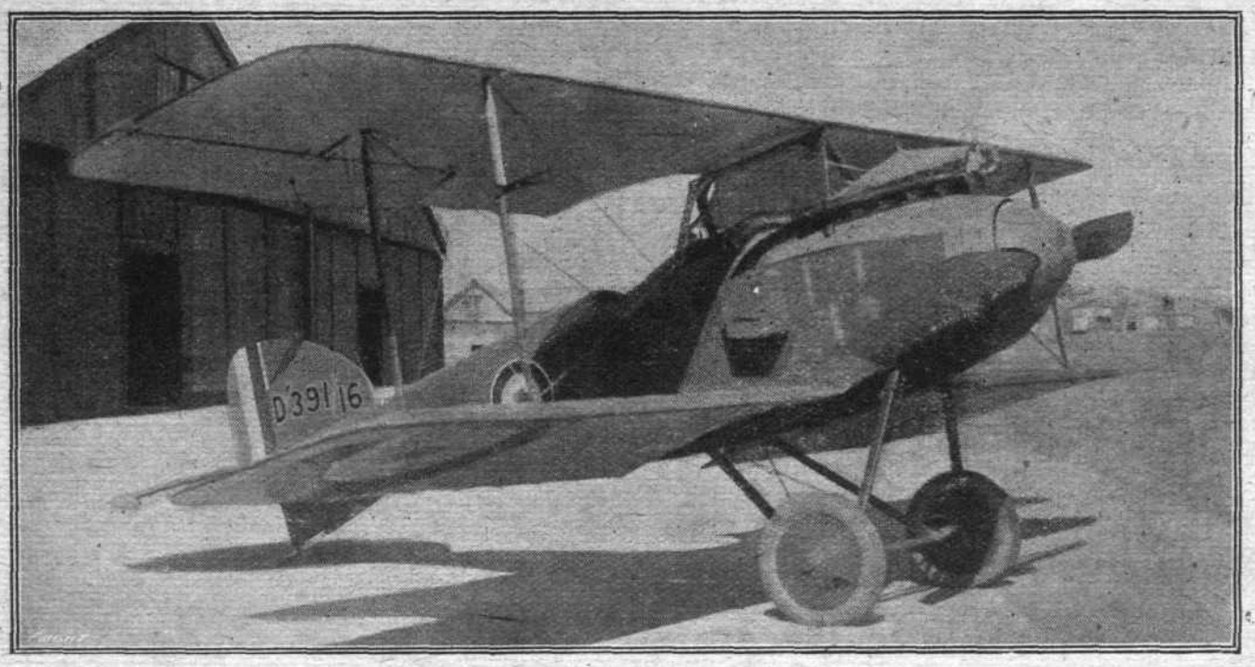
THE ALBATROS D. 1.—Side view.



THE ALBATROS D.1 "CHASER" BIPLANE.—Plan, side and front elevations to scale.

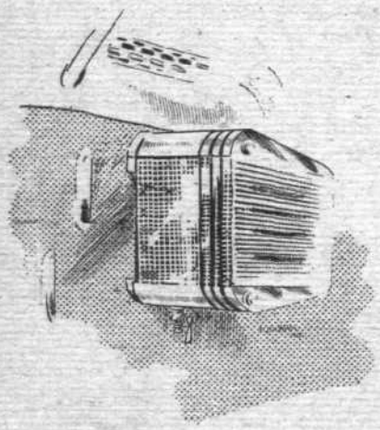


THE ALBATROS D.1.—Top: On the right a view of the exhaust side of the 170 h.p. Mercedes engine, and on the left the inlet side. Both views show the location of the machine guns. The right-hand lower sketch gives a view of the cockpit, and on the left a view below the nose of the *fuselage*, showing the mounting of the chassis and the abutments for the wing attachment.

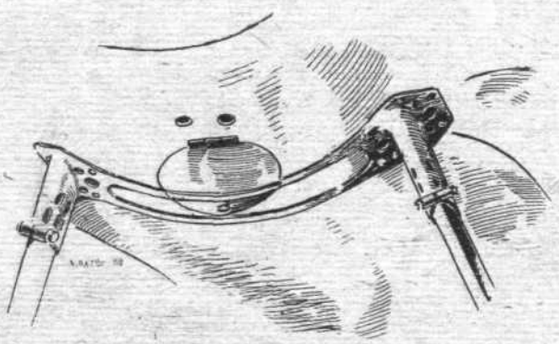


THE ALBATROS D. 1.—Three-quarter view from the front.

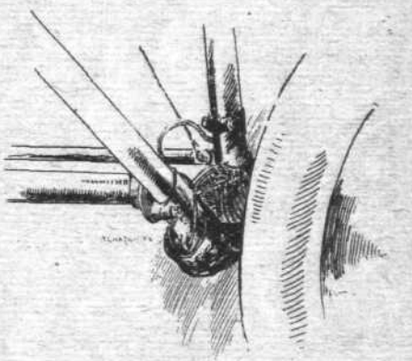
formed a slot, which receives an eyebolt passing through the main spar of the plane. At each slot are five holes passing horizontally through the tube, one of which—according to the adjustment required—receives the bolt that locks the eyebolt in the *cabane*. The arrangement is shown in one of the accompanying sketches.



One of the radiators mounted on the side of the Albatros D. 1.



The sockets securing the chassis struts to the *fuselage*. The struts may quickly be detached by loosening the bolts on the sockets.



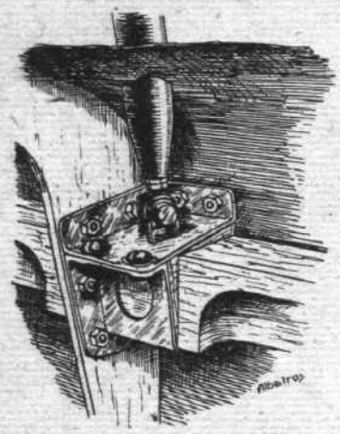
The shock absorber on the landing chassis. It will be seen that the rubber strands are interlaced.

THE ALBATROS D. 1.—Three-quarter view from behind.

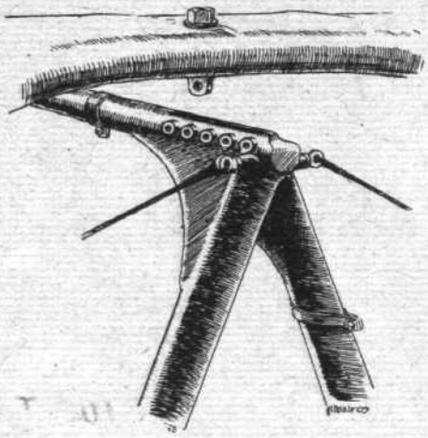
In order that the correct gap should be maintained in each adjustment for stagger, the lower end of the interplane struts and the *cabane* struts can be adjusted accordingly at their attachments to the planes and *fuselage* respectively. As may be seen in two of the accompanying sketches, this is done by means of the screw adjustment on the ends of the struts as shown. Only one pair of struts on each side of the *fuselage* separate top and bottom planes, these struts being of streamline steel tube. The attachment fittings are shown in the sketches, from which it will be seen that the top fittings are slightly different from the lower ones, which, as previously stated, are adjustable. As in other Albatros machines the main spars are located well forward, the front one being some 4 ins. from the leading edge, and spaced 2 ft. 7½ ins. from the rear one. They are of the usual Albatros rectangular section, fabric bound, and are bevelled off on the top at the extremities. The ribs, which are spaced 16¼ ins. apart in the top plane and 13¾ ins. in the bottom plane —except where the interplane struts are attached where the rib is displaced by a tubular compression member—are built up of slotted-out webs and somewhat narrow flanges. Between the leading edge and the front spar the upper surface of the plane is stiffened by a false rib between each of the ribs proper.

The lower plane is attached to an abutment built out from, and flush with the side of the *fuselage*. The mounting, which is shown in one of our sketches, consists of a form of bayonet socket-joint, access to which is obtained by means of doors on the under sides of the plane. As on other Albatros machines, the *ailerons* are given a wash out at the tips, and have operating cranks working in slots in the plane. They are hinged on auxiliary spars on the top plane only. The span of the top plane is 28 ft. 4 ins. and that of the lower 26 ft. 9 ins., the chord of both being 5 ft. 9 in., and the gap 5 ft. 3 ins. The total supporting surface is 269 sq. ft.

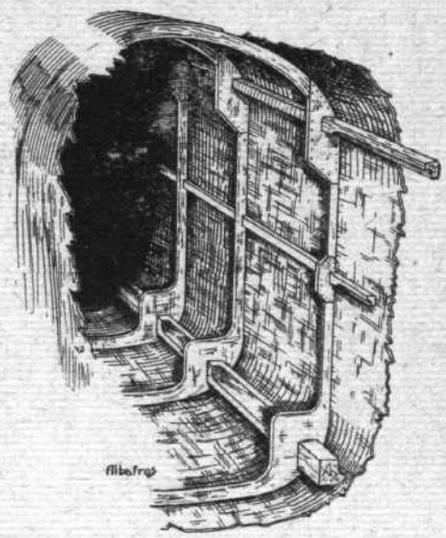
The stabilising plane, semi-elliptical in plan form, is divided into two parts, and is exceptionally thick (5¾ ins.). It is non-lifting, and is mounted, in the line of flight, without any external bracing. The framework is of wood and the covering fabric. Hinged to the trailing edge of the stabilising plane is a single



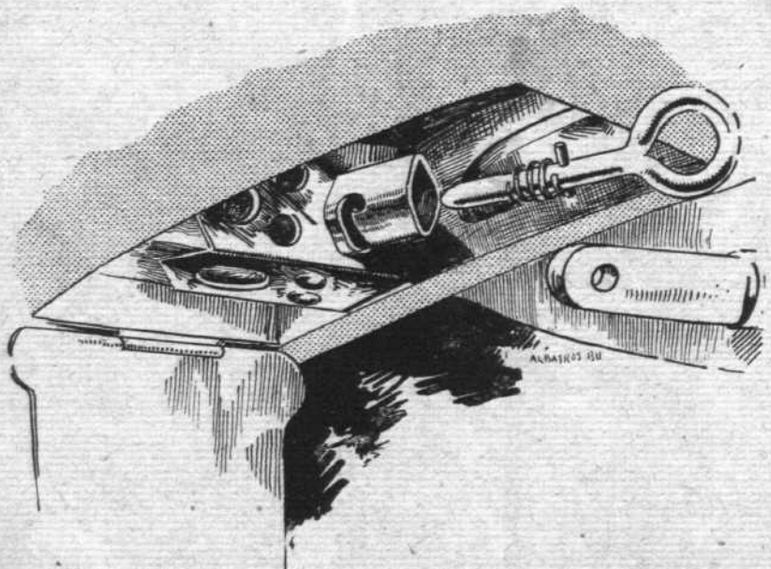
The Albatros D. 1.—The attachment of the *cabane* to the *fuselage*, showing the screw adjustment for alteration of stagger.



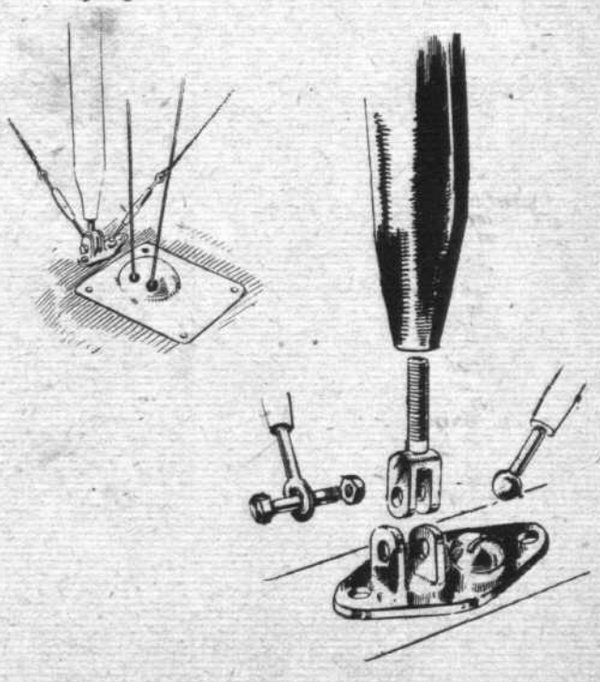
The adjustment of the top plane on the *cabane*.



The *fuselage* construction.



The quick release attachment of the lower plane to the *fuselage* on the Albatros D. 1.



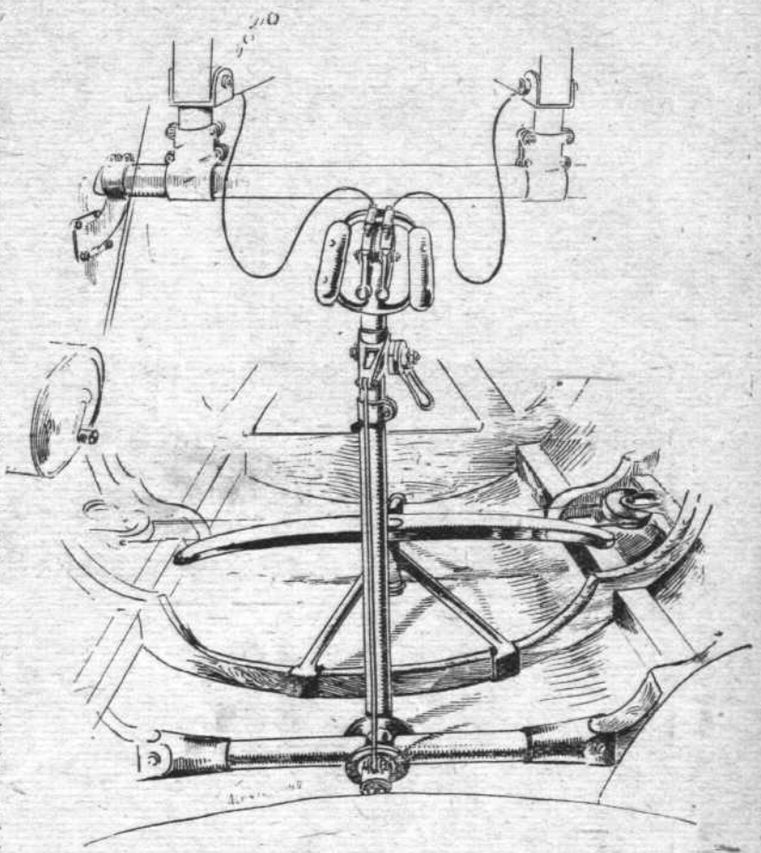
The adjustable interplane strut attachment.

elevator balanced by small triangular extensions forward of the outer extremities. A rounded vertical fin, like the stabilising plane very thick, is mounted on the top of the *fuselage* some distance forward of the extremity of the latter. It has a wood framework and a covering of three-ply. To its trailing edge is hinged the rudder, which is balanced by a triangular portion extending forward, and at the top of, the rudder post. The rear edge of the rudder does not extend further than the extremity of the *fuselage*. A small triangular fin, also of three-ply, is formed under the *fuselage* by the supports for the tail skid. The framework of the elevator and rudder is of steel tubing, covered with fabric. The rudder control cables are inside the *fuselage*; two small doors on the top of the latter allow for inspection and adjustment. The elevator cables also pass inside the *fuselage*. The junctions of the fins and stabilising planes with the *fuselage* are rounded off with three-ply.

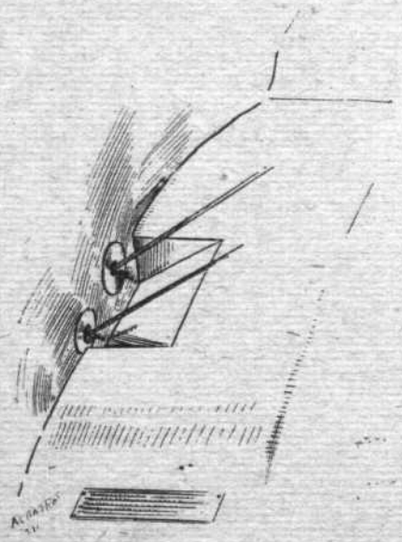
In the *fuselage* are to be found many points of interest. It is a modification of the standard Albatros system of *fuselage* construction, but differs in that it approaches nearer the true *monocoque*. It is, in fact, a compromise between the two, and suggests itself as an excellent solution to the problem of the "commercial" *monocoque*—simple in construction, low in cost, and of great strength. In section it varies from circular at the nose, to a horizontal knife-edge at the rear—being flat-sided, with rounded top and bottom in the centre. It is built up of six *longerons*, three a side, the central ones being of small rectangular section spruce ($\frac{3}{4} \times \frac{5}{16}$ in. aft of cockpit, forward of which they are $\frac{3}{4} \times \frac{3}{4}$ in. L-section). The top and middle *longerons* are placed one above the other, but the bottom ones are closer together. Top and bottom members are, except at certain points, of L-section, and up to the cockpit are of spruce, forward of which ash, $1\frac{3}{16} \times 1\frac{9}{16}$ in. is employed.

The *longerons* are supported in simple transverse "formers" or ribs, reinforced at the junctions with the *longerons*, spaced at intervals of, roughly, 2 ft. These formers are $\frac{3}{8}$ in. thick and $\frac{3}{4}$ in. deep. At the tail there are two thicket formers of the shape shown in one of the sketches. Forward of the cockpit there are four transverse formers, or supports, of three-ply, carrying the engine bearers, similar to those employed on other Albatros machines. Over the whole of this framework is laid a covering of three-ply, which is tacked and screwed to the *longerons* and formers. There is no wire bracing, nor are there any struts, except for two forming continuations of the front *cabane* struts extending to the chassis strut attachment. The pilot's seat is supported by two transverse tubes adjustably mounted on two auxiliary *longerons* on the side of the *fuselage*.

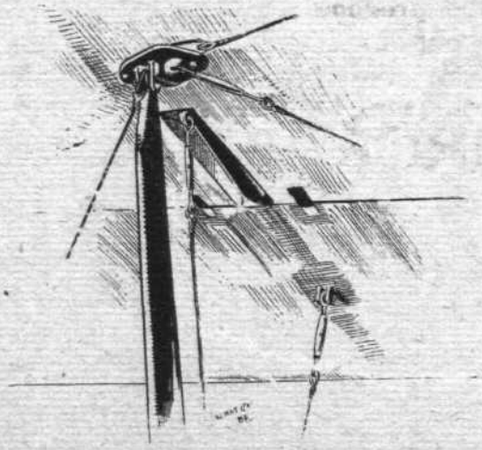
The engine, a 170 h.p. Mercedes, No. 27911, does not call for any special reference, being mounted in



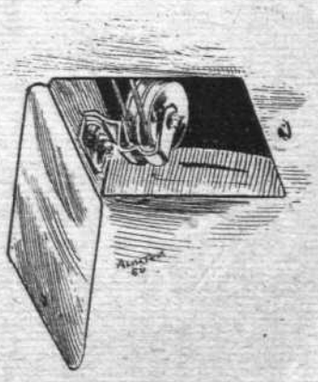
THE ALBATROS D 1.—A general view of the control, showing the two gun-triggers inside the grip, and immediately underneath the locking lever.



The anchorage of the lift cables on the Albatros D. 1.

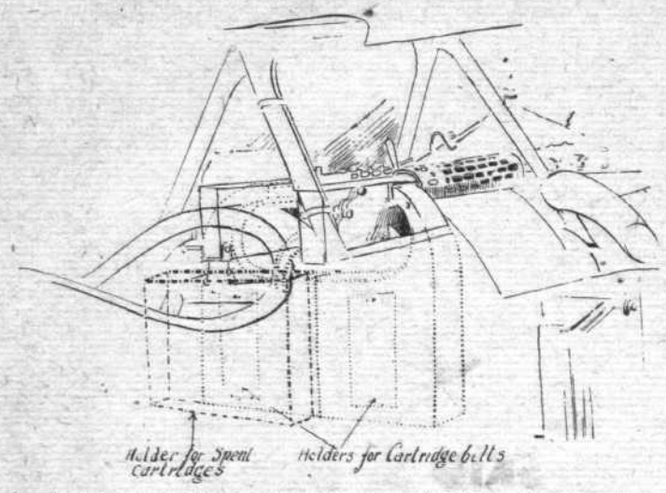


The interplane strut attachment to the top plane, and the *aileron* crank lever.



The *aileron* pulley inspection door on the lower plane.

a similar fashion to those on previous models. The radiators, however, differ from those usually employed. They are of the honeycomb type, and are mounted

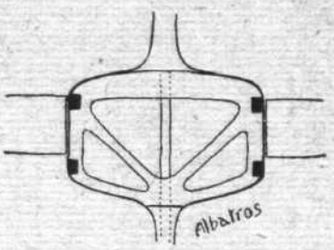


A diagram showing the cartridge-feed to the machine guns on the Albatros D. 1.

one on each side of the *fuselage*. Above, and to the left of the camshaft, is a flat water tank, one end connected to the engine jacket, and the other end to the tops of the radiators. The lower orifices of the radiators are connected to the water

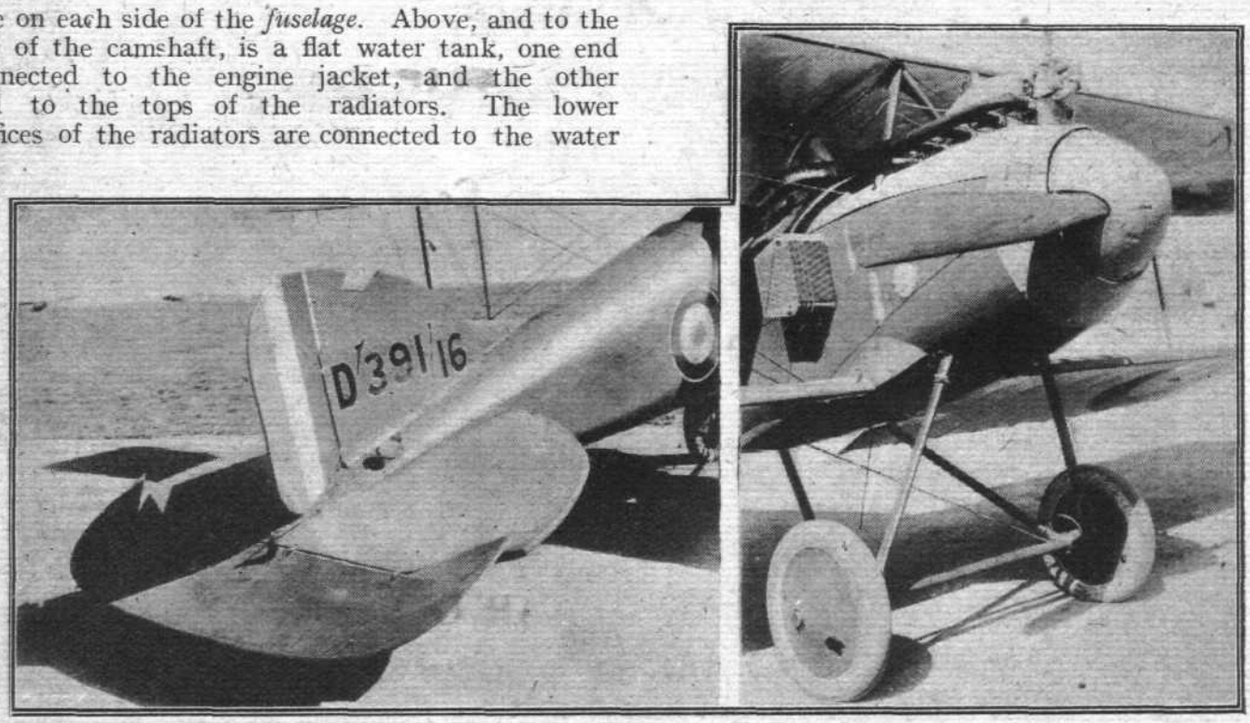
on the grip of the control lever. One of our sketches shows the ammunition-feed arrangement for the two guns.

The control lever is of the Fokker type, operating the *ailerons* and the elevator. It consists of a $1\frac{3}{16}$-in. tube mounted on a $1\frac{9}{16}$-in. transverse tube supported on a wooden base. A locking device is fitted whereby the lever may be locked against a fore-and-aft movement enabling the pilot to remove his hands, but operate the *ailerons* with his knees. This locking device, which consists of an arrangement of rods forming an articulated parallelogram, is shown in our sketch, from which other details of the control may be seen.



The Albatros D. 1.—Section of *fuselage* at the junction of the rudder post.

The landing chassis is of the conventional V-type with rubber sprung axle carrying a pair of 760 × 100



THE ALBATROS D. 1.—View of the nose and of the tail.

pump at the rear of the engine. On each side of the engine is mounted a machine gun, synchronised for firing through the propeller. They are centred about 1 ft., and are operated by two triggers mounted

disc wheels. Behind the axle is a transverse tubular tie rod, and the two rear struts are cable braced. The chassis is easily dismantled by withdrawing the struts from the sockets mounted on the *fuselage*.

◈ ◈ ◈ ◈

London Raid Leader Decorated.

THE *Lokalanzeiger* says that the Order Pour le Merite has been conferred on Captain Brandenburg, who commanded the air squadron which carried out the air raid on London on June 13th.

The One German Protest.

IN the years to come, the Socialist Breslau paper, *Volkswacht*, will be able to look back with pride to the time when it was the only German paper to protest against the scandalous air attack on the populace of London. This journal, which was suppressed by the Commander of the fortress of Breslau for its pains, in the course of its protest said:—

"Twenty-five dead men, 16 dead women, and 26 dead children, and 223 men, 122 women and 24 children wounded; that is the result of the attack on London, besides devastation of material, perhaps also of a military character. One must be seized with horror in imagining, even from afar, the effect which such a bomb produces in a children's school class, the killing of 10 of these little things on the spot, and the battering and maiming of others. One can share in the collapse of mothers who find their darlings thus while the husband perhaps is out at the front facing the enemy, and one can hardly conceive the rage which naturally follows such an event and is directed against its authors. Truly our British comrades have not an easy task, namely, in the face of such popular feeling to go to Stockholm and negotiate with their 'enemies.' It is a miracle if they are not lynched and torn to pieces in such a moment of fury."

FLIGHT

ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS.

SPECIAL COMMITTEE MEETING.

A SPECIAL MEETING of The Committee was held on Wednesday, the 27th inst., when there were present:—Col. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Wing-Commander A. M. Longmore, R.N., Major J. T. C. Moore-Brabazon, R.F.C., Mr. J. H. Nicholson, Lieut.-Com. H. E. Perrin, R.N.V.R. (in attendance), and the Assistant Secretary.

FINANCE COMMITTEE.

A Meeting of the Finance Committee was held on Thursday, the 21st inst., when there were present:—Mr. J. H. Nicholson, in the Chair, Mr. J. Stewart Mallam and the Assistant Secretary.

HOUSE COMMITTEE.

A Meeting of the House Committee was held on Friday, the 22nd inst., when there were present:—Mr. J. H. Nicholson, in the Chair, Capt. R. L. Charteris, R.F.C., Mr. C. G. Greenhill, Mr. J. Stewart Mallam, Mr. J. H. Spottiswoode, Lieut.-Com. H. E. Perrin, R.N.V.R. (in attendance), and the Assistant Secretary.

House Accounts.—A Profit and Loss Account for the month of May was submitted, which showed that the House Finances were satisfactory.

Club House.

The following prices have been fixed for the present by the Committee:—

Bedroom (including Bath)	5*s.* each per night.
Breakfast	2*s.* 6*d.*
House Luncheon	2*s.* 6*d.*
House Dinner	3*s.* 6*d.*

Billiard Room.

The Billiard Room is now open for the use of the Members.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Roya Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W. 1.

Subscriptions.

	£	s.	d.
Total subscriptions received to June 19th, 1917	11,827	17	7
G. H. Mansfield, Managing Director of the Aircraft Supplies Co., Ltd., 17, John Street, Theobald's Road, W.C.; Proceeds of the sale of copies of "Standard A.G.S. Parts for Aircraft," by Bernard Isaac (Third contribution, making a total of £13 5*s.*) ..	3	17	6
Employés of Ruston, Proctor and Co., Ltd., Aircraft Works (Nineteenth contribution)	1	0	0
Total, June 27th, 1917	11,832	15	1

B. STEVENSON, Assistant Secretary.

3, Clifford Street, New Bond Street, W. 1.

THE ROLL OF HONOUR.

REPORTED by the Admiralty:—

Killed.

Prob. Obs. Off. T. Rogers, R.N.

Accidentally Killed.

Flight Sub-Lieut. J. R. Bibby, R.N.
Flight Sub-Lieut. H. L. Crowe, R.N.

Missing, believed Killed.

Flight Sub-Lieut. J. E. Potvin, R.N.

Previously reported Missing, now Killed.

Flight Sub-Lieut. S. L. Bennett, R.N.

Previously Missing, now Officially presumed to have been Killed.

Sub-Lieut. R. C. Whiteside, R.N.V.R. (R.N.D.), attd. R.F.C.

Previously reported Missing, now presumed Accidentally Killed.

Flight Sub-Lieut. G. G. Avery, R.N.

Accidentally Injured.

Prob. Flight Off. A. H. Garland, R.N.

Missing.

Flight Sub-Lieut. L. H. Parker, R.N.

Missing, believed Prisoner of War.

Flight Sub-Lieut. L. P. Paine, R.N.

Previously reported Missing, now Officially reported Prisoners of War.

Flight Sub-Lieut. J. B. Daniell, R.N.
Flight Sub-Lieut. H. S. Murton, R.N.

Reported by the War Office:—

Killed.

2nd Lieut. T. R. C. Birkin, Drgn. Gds., attd. R.F.C.
2nd Lieut. H. W. Craig, R.E., attd. R.F.C.
2nd Lieut. R. Grant, R.F.C.
Capt. C. H. C. Keevil, W. Yorks, attd. R.F.C.
Lieut. W. E. Lockhart, Can. Eng., attd. R.F.C.
Lieut. W. B. Protheroe, R.F.C.
2nd Lieut. W. Turnbull, R.F.C.
2nd Lieut. J. A. Vessey, R.F.C.
2nd Lieut. R. S. Watt, R.F.C.

Previously Missing, now reported Killed.

2nd Lieut. G. A. H. Davies, Monmouths. and R.F.C.
2nd Lieut. A. E. J. Dobson, R.F.C.
Lieut. A. J. Jessop, R.F.C.
2nd Lieut. R. C. Oakes, R.F.A., attd. R.F.C.

Previously Missing, now reported Missing, believed Killed.

2nd Lieut. V. H. Adams, R.F.C.
Capt. A. S. Allen, M.C., W. Ont., attd. R.F.C.
2nd Lieut. T. L. Pinson, S. Staffs., attd. R.F.C.

Previously reported Wounded, now reported Killed.

77687 2nd Air-Mech. R. Hickling, R.F.C.

Previously reported Wounded, now reported Died of Wounds.

21451 1st Air-Mech. R. W. Robson, R.F.C.

Wounded.

2nd Lieut. C. L. Adamson, R.F.C.
2nd Lieut. G. Allsop, Sher. For. and R.F.C.
Capt. W. I. Bailey, Can. Inf., attd. R.F.C.
2nd Lieut. A. Carruthers, R.F.C.
2nd Lieut. N. Couve, R.F.C.
2nd Lieut. A. MacN. Denovan, R.F.C.
2nd Lieut. R. I. Dines, London and R.F.C.
Lieut. T. F. Flanagan, E. Ont., attd. R.F.C.
2nd Lieut. J. Harper, R.F.C.
2nd Lieut. A. W. Hogg, Yeo. and R.F.C.
2nd Lieut. V. J. Holland, R.F.A. and R.F.C.
2nd Lieut. E. S. Jacobs, R.E., attd. R.F.C.
2nd Lieut. S. B. Kington, D. of Wellington's, attd. R.F.C.
2nd Lieut. K. J. Knaggs, Warwicks, attd. R.F.C.
2nd Lieut. J. A. Loutit, Cambs. and R.F.C.
Capt. K. G. MacDonald, Can. F.A., attd. R.F.C.
2nd Lieut. O. L. McMaking, Yeo. and R.F.C.
2nd Lieut. N. G. Pring, R.F.A., attd. R.F.C.
2nd Lieut. C. S. Richmond, R.F.C.
2nd Lieut. D. W. Stacey, R.F.C.
2nd Lieut. W. J. Wyatt, R.F.C.

Missing.

2nd Lieut. R. W. L. Anderson, R.F.C.
Capt. F. R. Cubbon, M.C., Ind.Inf., attd. R.F.C.
Lieut. H. Rogerson, Loyal N. Lancs. and R.F.C.
Capt. F. J. H. Thayne, M.C., R.F.C.
2nd Lieut. J. De Conway, Yeo. and R.F.C.
21293 Sergt. J. Dempsey, R.F.C.
77252 2nd Air-Mech. R. Sibley, R.F.C.

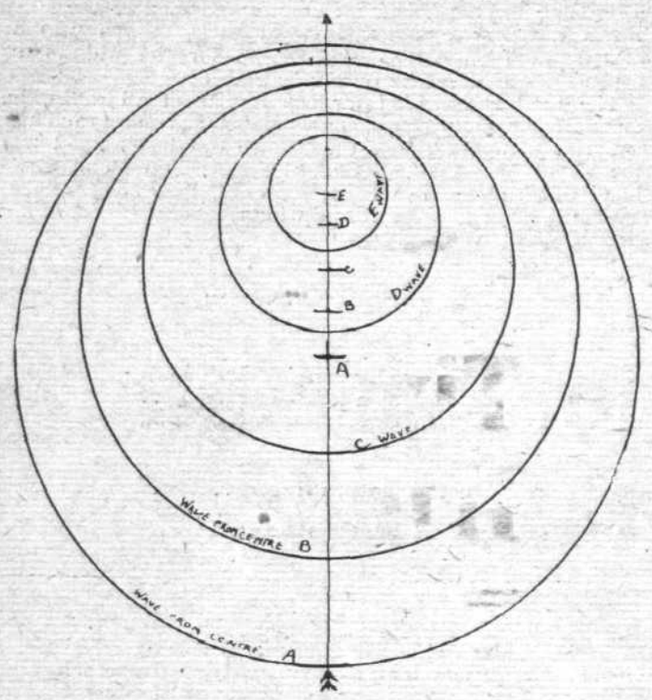
Previously Missing, now reported Prisoners of War in German hands.

Lieut. R. J. Bevington, R.F.A., attd. R.F.C.
Lieut. A. Binnie, R. Scots Fus., attd. R.F.C.
Lieut. N. A. Birks, R.F.C.
Lieut. A. Burbury, M.C., Yorks., attd. R.F.C.
Lieut. G. S. French, Cambs. and R.F.C.

Answers to Correspondents.

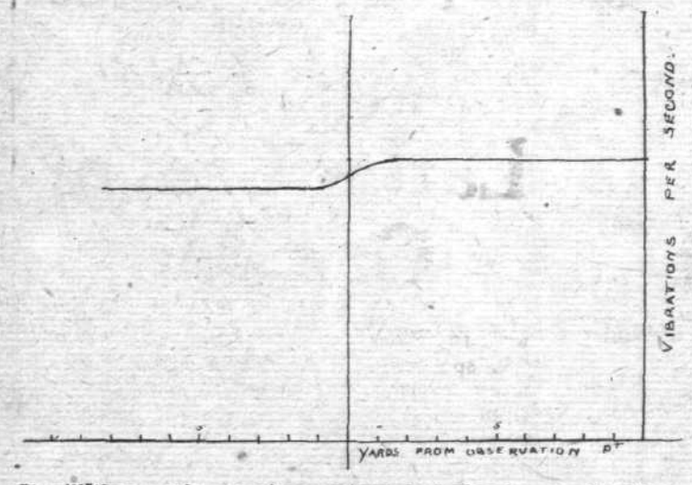
G. B. P. (Huntingdon) sends us the following with regard to the change in sound of a passing aeroplane :—

"In your issue of May 17th, H.W.W. (Hunts) states that he notices the sound rise as the aeroplane approaches the observer. I beg to differ from him on this point, though I



agree in that the sound seems lower after the machine has passed.

"My own impression is the following: Suppose a fast machine is coming up from some distance, the note will be of constant pitch till the centre of disturbance is a few feet in front of the point of observation, when it will perceptibly decrease in pitch till about the same distance behind the point.



It will then again remain constant, but at a lower vibration than before.

"The enclosed graph shows more clearly my meaning, while the illustration shows why the leading tone is higher. The sound waves in front of the centre of disturbance are more compact than those behind owing to the wave circles being eccentric."

J. W. (Sutton Coldfield).—We do not quite know what you mean by a foot control aeroplane. On all modern machines foot control is employed for the rudder. In the early Nieuport monoplanes the rudder was operated by a side to side movement of the hand lever, a to-and-fro movement of which actuated the elevators. The warp was operated by a foot bar, much after the fashion of the modern rudder foot bar. Presumably what you have in mind is a form of control worked entirely by the feet, so as to leave the pilot's hands free to operate guns, &c. Although such a system would have much to recommend it, it would be difficult to get it taken up at the present moment, as this would mean a radical departure from standard controls, necessitating a change not only on the machines used at the Front, but presumably also on those used for training purposes.

J. E. W. B. (Norwich).—The machine is one of the R.E. type, but from your sketch we are not able to determine its class number.

Cpl. C. W. G.—An aeroplane flying at an altitude of 3,000 ft. and at a speed (over the ground) of 60 m.p.h. would release its bombs a horizontal distance of 1,200 ft. ahead of the target. In other words, if the machine did not drop the bombs until it was immediately above the target, the bomb would strike 1,200 ft. beyond the target. These figures do not take into account air resistance. In our "Answers to Correspondents" column in the September 7th, 1916, issue of "FLIGHT" we published a graph showing the distance ahead of target an aeroplane would drop its bombs, the range of speeds and altitudes varying from 30 to 120 m.p.h., and from 200 to 6,600 ft. respectively.

2nd A.-M. R. R. (R.F.C.).—Some experiments were carried out at Mons. Eiffel's laboratory on wings in tandem. In one of these experiments the two wings were similar and measured 900 x 150 mm. They were tested at two distances apart—200 and 400 mm.—corresponding to 1·33 and 2·67 times the chord. The angle of incidence of the front wing over and above that of the rear wing was varied from 0 to 12 degrees. The results were compared with those of a theoretical tandem monoplane without mutual interference of the two wings, and were found to be as follows :—

Incidence of Front Wing.	Ry		Rx	
	Spacing.			
	20 cm.	40 cm.	20 cm.	40 cm.
0°	0.58	0.51	1.22	1.17
3°	0.69	0.65	1.26	1.22
6°	0.83	0.80	1.29	1.24
9°	0.88	0.84	1.20	1.12
12°	0.87	0.89	1.15	1.14

From this table it will be seen that Ry, or the lift, was reduced at 6 degrees incidence by 17 per cent. for the shorter spacing and by 20 per cent. for the longer spacing. At the same time the resistance Rx was increased by 29 and 24 per cent. respectively.

"Puff-Puff" (Shoeburyness).—Of the two we should say that the exhaust of the aeroplane engine makes the more noise. As regards the performance of aeroplanes, several new records have, we believe, been established during the war, but of these we are not permitted to give details at present. The pre-war records of duration and altitude were as follows :—Boehm solo, 24 hours 12 minutes; Oelerich, 8,150 metres (about 26,730 ft.). Both pilots were German.

H. E. B. (Walthamstow).—An aeroplane flying at an altitude of 3 miles, or say 16,000 ft., and at a speed of 100 m.p.h., should, neglecting air resistance, release its bomb 4,630 ft. ahead of the target.

G. R. H. (Dunstable).—We have not heard of any authenticated case of a machine looping with the chassé inside. You will not be able to join the R.F.C. until you are of military age.

A. L. C. (Twickenham).—In the R.N.A.S. the rank and pay of the junior officers is: Flight Sub-Lieutenant 10*s.* a day; Flight Lieutenant 12*s.* a day and 1*s.* a day in addition for each year's service (up to four years) in that rank. Each officer has also 8*s.* a day flying pay. Probationary Flight Officers receive 10*s.* a day plus 4*s.* a day flying pay.

In the R.F.C. the lowest rank is flying officer with 12*s.* a day, increasing by 1*s.* a day for each year of service (up to four years), plus 8*s.* flying pay. Equipment officer, 3rd class, 12*s.* a day. Flight commander 17*s.* a day, plus 8*s.* flying pay.

J. H. (Barnet).—We think you are correct that the picture was taken at Hendon. Anyway, it is a Caudron machine.

A. B. C. (Newbury).—It is impossible to say definitely how long the training lasts. The training is carried out at various schools and centres, at one of which the duties of an infantry officer are learnt. You will find the system of training described in General Brancker's paper on the subject published in "FLIGHT" for February 1st last.

AIRISMS FROM THE FOUR WINDS

THE following appeared in the *London Gazette* on June 23rd in regard to the Chairman of the Royal Aero Club :—

Brigade Commander.—Lieut.-Col. Comdt. J. G., Duke of Atholl, C.B., M.V.O., D.S.O., from Yeo. (T.F.), and to be Temp. Brig.-Gen. while so employed, vice Col. E. D. J. O'Brien, C.B.; June 12th.

THE Duke of Atholl once again expressed his very sound and strong views upon the question of reprisals when speaking at Glasgow last Monday. His Grace said that accidents might happen in air raids, but he did not think we would ever get British officers to undertake deliberate raids for the purpose of assassination, as the Germans did. If people would only talk less and leave the matter in the hands of the airmen and the Government, they would see that those who had been murdered on this side would not go unavenged. If there were to be reprisals without a military objective, let them take the form of trial by court-martial after the war of those responsible for the raids. There was nothing the Hun would like more than to see us sitting with our flying men round London, giving him even one day's rest in France, but His Grace trusted we were not so foolish as to fall into the trap. At all events, if the war went on much longer, the Germans would have the delightful sensation of seeing not only hundreds, but thousands of aeroplanes from France, Britain and America blackening the sky on the Western Front, and then God help them.

THE Dean and Chapter of St. Paul's have rightly put a veto on the proposal for giving warning of air raids by the ringing of the cathedral bell. The suggestion was, for many reasons, an absurdity. To start with, it would be for all practical purposes inaudible to most of the citizens, and as Canon Alexander points out, although a few might hear it, he himself in the Chapter House frequently cannot do so. If warnings are absolutely necessary, the Canon thinks some other means, such as are in use in large provincial centres, ought to be employed. "On the day after the air raid," he says, "I received several warnings, spread over many hours. If the Lord Mayor's suggestion had been adopted the bell would have been ringing practically all day!"

ASSUMING warnings are duly decided upon generally, we doubt whether, beyond a panicky and jumpy feeling being unnecessarily engendered in the majority of the people, any good will result. Quite the contrary, in fact. After all the one factor of reasonable safety is to take cover and remain there as an antedote to flying bomb splinters and other bric-à-brac. Dodging about from one floor to another, or from one place to some other "shelter," may only lead to the very disaster it is sought to avoid. Take, by way of example, the two following communications which both appeared in a daily paper the same day under different headings last Saturday. No. 1, from Mr. A. Woodbridge, of 27, Finchley Road, Westcliff, puts the case thus :

AIR RAID WARNINGS.

"What of the occupants of the top part of a very high building when the roof is demolished, the top floor destroyed, the staircase shattered, when a bomb has fallen, when escape is slow, risky, perhaps impossible? Why? Because there has been no warning. The foregoing really happened to an office last week. There are many thousands whose lives and safety are in fearful jeopardy because no warning is given."

Now take case No. 2, from Mr. Oliver Thornycroft, A.M.I.E.E., B.A. Engng., of 19, Reynolds Close, Hampstead Way. Mr. Thornycroft's views are as follows :—

"TAKING COVER" IN AIR RAIDS.

"Much is being thought and said regarding the advisability of warning the public of the presence of air raids. Very little is said, however, as to what is the best thing to do when the bombs are falling around. The public is advised to take shelter, and with this instruction the prudent mother will probably take herself and her children to the basement or ground floor.

"Now, personally, I have instructed my wife to proceed with the children to the attic, as I am of the belief that this position is very much safer than lower in the house. My house, like an enormous number in and around London, has only three floors, and is about 40 ft. high. A good-sized bomb dropping from a height of 15,000 ft. on to such a house would, provided it did not explode instantaneously, penetrate from the roof to the ground floor in less than one-tenth of a second.

"It should, I think, be stated authoritatively where bombs of the type at present employed in these raids would be expected to burst after falling upon the average housetop."

SUCH opposite views might be multiplied *ad infinitum* and then start all over again. It is very much a case of luck, we fancy, beyond the ordinary sane precautions of taking to cover and keeping there during the popping. Our view is that warnings are a distinct mistake.

BY way of commentary upon the diverse views held upon the subject, the following is interesting from the *Frankfurter Zeitung*, which announces that experiments to determine the best kind of warning in case of "danger from the air" have now been concluded. They have shown that the best method for Frankfurt is to fire alarm signals. In case of an air raid alarm signals will therefore be fired from four different quarters of the town. They will mean the existence of immediate danger. Notices on the advertisement pillars and in places of public resort will tell the public how to behave. During an attack the tramways will be stopped. When the danger has passed the trams will start again, and the bells will be loudly rung. At the same time a large number of Frankfurt factories will blow their sirens. Between 11 p.m. and 6 a.m. no warning will be given.

IT is a matter for gratification to know that the Government are seriously considering the granting of compensation or relief to those affected by these piratical air attacks. Also the Government Committee of the Prince of Wales's Fund are to be congratulated upon their decision last week to organise relief for sufferers from the raid in conjunction with the Lord Mayor's Fund. The distribution will be left to the local committees of the Prince of Wales's Fund in the districts where the sufferers reside, rather than where their injuries were received. After investigation the local committee will draw the necessary relief money partly from the Prince of Wales's Fund and partly from the Lord Mayor's.

IN view of the possibility of a repetition of these raids and the casualties among children, the Council of National Baby Week have been wise in abandoning the processions of mothers and their babes that had been arranged for Baby Week in London. Probably the date had already been noted by the Hun Higher Command as an auspicious one for securing an extra large bag of child victims. Appropriately the Committee have arranged at Lincoln and at another city in East Anglia for the distribution of Baby Week publications by means of aeroplanes.

REPRISALS! Taube or not Taube? is the question of the hour, but surely wild statements like unto the one attributed to Mr. Pemberton Billing, M.P., at a Ramsgate meeting last Saturday, to the effect that "at the cost of one day's war expenditure sufficient bomb-dropping machines could be provided to finish the war off victoriously in seven days," hardly help towards a considered judgment upon the much-debated point.

IT is this sort of thing that leads to such a paragraph as the following in the *Daily Sketch* being possible :—

"So much does personal unpopularity count in the Commons, that it is a certainty that if anyone but Pemberton Billing had moved for a discussion on air reprisals and warnings, the House would have given him hearty support."

AND the pity of it.

THE reprisal business has many sides to it which in the main are not even considered. There are the personal views of the respective pilots who are asked—or rather ordered—to do these things. Military strafing, yes, and the more continuous and systematic the better; but, after all, the other deliberately done *might* leave a nasty taste in the mouth.

IN this connection, in a "Londoner's Diary" was set forth recently the result of a discussion on the subject with

a British pilot, who has been in the Army many years and "in the air," as he put it, almost ever since the war began. I asked him (says "The Londoner") what was the opinion of the R.F.C. regarding reprisals for air raids.

"Well," he said, "of course, I cannot give you the collective opinion of the R.F.C. on that or on any other subject, but I can say that I know airmen who favour reprisals, and also airmen who regard reprisals—that is, attacks on open German towns—with horror.

"But the British airman—every British airman—would ten thousand times rather fight ten Boche birds single-handed on the Western Front than bomb a quiet German town and kill women and children. And we're fighting and killing fast Boche airmen in the West. We've got 'em there, and that's what's going to win this war.

"There are so many ways of looking at this reprisals question, but, above all, the main principle to be borne in mind is that to win a war you must defeat the armed forces of your enemy.

"As for the R.F.C., if any squadron is ordered to bomb a German town, it will, of course, be done. And likewise, if the order comes to bomb Berlin it will also be carried out—possibly with a glad heart!"

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WHAT a relief it is to know that the German Government has given its "formal" assurance that the internment of Allied Flying Corps and other officers in the prisoners' camp at Karlsruhe has no connection with the policy of reprisals. Some rabid British patriot may otherwise have been justified in suggesting that it were otherwise. We are now waiting for the peaceful pro-German to arise somewhere and aver that it is purely out of consideration for their health that the German Government have transferred our officer prisoners to this greatly sought after fashionable resort. Under such an assurance it is but a natural corollary that our own Government should state they are not prepared to adopt the suggestion of placing German prisoners of war in the unfortified towns in the Isle of Thanet. We evidently are not as solicitous of the health of our temporary guests as the Huns.

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THE successor to Lord Northcliffe in the Chairmanship of the Civil Aerial Committee is ——, well just wait and see.

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FROM New York comes the announcement that Mr. H. V. Jellicoe, nephew of Sir John Jellicoe, has enlisted in the aviation corps, and has already gone to Ontario.

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THE name of Capt. Ball, V.C., is to be associated by the members of the Eccentric Club with the very good work undertaken by the Club in connection with the hostel for disabled men which Brig.-Gen. Charlton, R.F.C., is to open on July 4th. This hostel is for men who, having passed through Roehampton and similar hospitals, decide to undergo training at the Cordwainers' Institute.

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CONGRATULATIONS to Private Joe Fox, R.F.C., of Leeds, who, by his third successive win on Monday at the National Sporting Club of the bantam weight championship boxing contest, has secured in perpetuity the Lonsdale Belt. Fox's opponent on Monday was Seaman Symonds, of Plymouth, who put up a spirited and strenuous fight, but had to cry a go at the eighteenth round against young Fox's telling jabs and stolid defence.

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"IT is very difficult to judge speed on the road when one is used to flying at 70 to 80 miles an hour in the air," said a R.N.A.S. officer who was fined at Marylebone last week for driving a motor car at excessive speed.

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Wonder how "the quick and the dead" will get on presently when this self-same sport gets going on a nice speedy little scout.

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THERE was a good deal in the interpolation "Ask the Kaiser" of the Speaker the other day in Parliament in response to Mr. Macmaster's enquiry of Mr. Macpherson: "Why is it that Paris appears to be comparatively immune from attack while London is not?" Perhaps one of these days we may be able to get a direct answer.

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PURITY of the air is a subject of very considerable interest to the pilot of to-day and in the days to come. Therefore the collection, compilation and publication of exact statistics on the subject of the contributory causes of the pollution of the atmosphere are to be heartily welcomed. In addition, the facts so obtained should be of much value in connection with the study of problems relating to fuel economy and smoke prevention as well as agriculture, health generally and the preservation of buildings.

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WE are glad, therefore, to note that the Committee for the Investigation of Atmospheric Pollution has been constituted an "Advisory Committee on Atmospheric Pollution" to the Meteorological Office, and a grant of £500 has been allotted by the Department of Scientific and Industrial Research to cover the cost of the work for the current year. The grant was made after careful consideration of the advantages likely to accrue from the continuation of the work even during the war, and it was indicated that every effort should be made to maintain existing stations and to increase the scope of the movement. To anyone directly interested, full information as to method of working, with standardised instructions and blank forms for returns, can be obtained from the Honorary Secretary, Dr. J. S. Owens, 47, Victoria Street, London, S.W.1.

A view of the Spad used by the Lafayette Escadrille.—(*"Aerial Age Weekly."*)

Personals.

Casualties.

Lieutenant GEORGE ARMITAGE, killed, was the only son of Mr. and Mrs. G. T. Armitage, of Moorcroft, Uppermoor, Pudsey. On the outbreak of war he joined the R.G.A., and in March of the following year he received his commission in the R.F.A. Later he transferred to the R.F.C. He was educated at Easingwold Grammar School, and before enlistment was on the staff of the London City and Midland Bank at Wetherby. Lieutenant Armitage was 21 years of age.

Flight Sub-Lieutenant SAMUEL L. BENNETT, R.N., now officially reported killed in an air engagement on April 29th, was the only son of Mr. and Mrs. Bennett, of Tipton Hall, Tipton St. John's, Devon, and was 25 years of age. He was educated at Clifton, and had only just finished his course at Pembroke College, Cambridge, when war was declared. He joined the R.N. Armoured Car Section at once, and served for a year at the Front as interpreter and despatch rider. He then transferred to the R.N.A.S., in which he had done much valuable work.

Second Lieutenant SIDNEY HAROLD LIONEL DOUGLAS-CROMPTON, Royal Fusiliers (killed in action on June 7th while leading a bombing party), was only son of Mrs. Douglas-Crompton, Woodcot, Marlow Common, Bucks. He was appointed to the Naval Wing of the R.F.C. in June, 1916, and in April of this year entered the Army, receiving a commission in the Royal Fusiliers.

Second Lieutenant CHARLES SIDNEY HALL, R.F.C., who was only 18 years of age, was killed in an air fight at the Front on April 7th. He was the son of Mr. J. J. Hall, of Westfield, Ashington, Northumberland, and was educated at the North-Eastern County School, Barnard Castle, and Armstrong College, University of Durham, where he was preparing for the profession of a mining engineer. He was a member of the O.T.C. both at school and at the University, and held an honorary instructor's certificate and the medallion of the Royal Life Saving Society. His eldest brother, Captain L. W. Hall, R.F.C. and Border Regiment, is an R.F.C. fighting instructor, and his other brother is serving with the R.E. at the Front. Mr. Hall was very popular with all ranks.

Lieutenant THOMAS FARQUHAR LUCAS, Royal Warwickshire Regiment and R.F.C., killed in action on June 16th, was elder son of Sir Edward Lucas, of North Gate, Regent's Park. He was 30 years of age, and had his commission in the Warwickshires in February, 1915, and was promoted in March, 1916. He was attached to the R.F.C. in October, 1915, and was appointed Balloon Commander in January of this year.

Lieutenant MURRAY EDELL (PAT) NEWTON, R.F.C., killed on June 18th, was the only son of the Rev. G. Herbert Newton, Vicar of Bromley Parish Church, E., and formerly for many years vicar of St. Matthew's, Willesden, and Mrs. Newton. He was educated at Roundwood College, Harlesden, and St. John's School, Leatherhead, and afterwards at the Central Technical College for Engineering, South Kensington. At the outbreak of war he enlisted in the Artists Rifles, and obtained his commission in the London Regiment. After a course of machine gun instruction he was appointed instructor to the regiment, and afterwards to his brigade. Joining the R.F.C. in the summer of 1915, he quickly obtained his wings and became an efficient pilot. His captain writes: "Your son was engaged with others of our machines fighting some of the enemy, when both he and his observer were shot and the machine fell to earth. Their bodies have been buried near where they came down, as it was just where the opposing lines are."

Lieutenant W. B. PROTHEROE, R.F.C., killed, was the son of Mr. W. H. Protheroe, Park Crescent, Llanelly. He joined the Royal Engineers section of the Territorials four years before the war, and in 1914 was given a commission in the Welsh Regiment. Since January he had been in the R.F.C.

Captain CHARLES LINDSAY MURRAY SCOTT, North Staffordshire Regiment and R.F.C. (previously reported missing, now officially reported killed in aerial action near Bapaume on February 15th), was the only son of Lieutenant-Colonel and Mrs. Lindsay Scott, of Whittington House, Sandgate, and nephew of General Sir Archibald Murray, Commanding-in-Chief, Egypt. Captain Scott came from Ceylon at the outbreak of war, and was given a commission in a battalion of his father's old regiment, the North Staffordshires. He had seen a good deal of service on the Western Front, and was wounded on Hill 60 in April, 1915. On his recovery he joined the R.F.C., and after five months' "observing" in France he obtained his wings in July last year, being subsequently posted as an instructor on the Home Staff. Captain Scott returned to the Front on January 2nd, and was within three days of his twenty-fifth birthday when he met his death.

Second Lieutenant W. D. SCOTT-MILLER, Royal Fusiliers, attached R.F.C., who died on June 22nd from injuries received in an accident, was eldest son of Colonel and Mrs. W. Scott-Miller, of Eastwood, Roehampton Lane, S.W. He was 18½ years of age, and on passing out of Sandhurst on May 2nd was posted to the R.F.C. He had nearly completed his training for his wings when the accident occurred. The funeral, with military honours, took place at Putney on Tuesday last.

Lieutenant ADOLPHE DREY, M.C., A.S.C., attached R.F.C. who died in Egypt on May 9th as the result of a flying accident, was the second son of the late Emile Drey, of Roubaix, France, and nephew of Oscar Drey, of Withington, Manchester, and was in his twenty-third year. He was educated at Ladybarn House School, Withington, Gresham's School, Holt, and at University College, Reading, where he obtained his diploma in agriculture. Joining the A.S.C. in 1915 he saw service first in France and then in Gallipoli, where he stayed till the evacuation. He was then sent to Egypt and promoted Lieutenant. In June, 1916, he was awarded the Military Cross for his services in Gallipoli. He had only recently been transferred to the R.F.C., and was engaged in a course of instruction when he was killed.

Flight Sub-Lieutenant R. V. KNIGHT, R.N., had been flying for six months, and was an assistant instructor at an East Coast flying school, when he fell on March 12th, aged 23. He was educated at Wells and Bedford Grammar Schools, and at Neuchatel. After a time at Bristol University he went to Guy's Hospital, and on the declaration of war volunteered for service and was appointed Lieutenant in a London battalion, with which he fought at the battles of Festubert and Loos. In Rugby football he was captain of Bedford, held the East Midland and Somerset caps, played at Bath in the first match against the South Africans, and was reserve for England at the age of 19. He was also a good hockey player, swimmer and cricketer.

News has reached Tottenham of the death of Second Lieutenant E. A. MARGETSON, of Eve Road, Tottenham, of the R.F.C. He had been sent to a flying school in Surrey, and was being taken up for the first time when the engine stopped, and the 'plane dived to earth, both pilot and pupil being killed.

Missing and Prisoners of War.

Captain ARTHUR SPENCER ALLEN, M.C., Western Ontario Regiment, attached R.F.C. (previously reported missing, now reported missing, believed killed), was awarded the Military Cross last September "for conspicuous gallantry on several occasions, notably when he organised and led parties against an enemy post, dispersing them with bombs. He also volunteered and cut a gap in the enemy's wire previous to a raid."

Mr. Hugh Barrie, M.P. for North Londonderry, has received a telegram from the Geneva Red Cross intimating that his son, Second Lieutenant FRANK BARRIE, R.F.C., is reported a prisoner of war at Karlsruhe. The young officer was reported missing by the War Office on June 3rd.

Mrs. E. G. Freeman, of Clifton House, Linslade, Leighton Buzzard, received a wire from the International Red Cross Committee, Geneva, on Friday, June 15th, to say her son, Second Lieutenant ERNEST I. DUNFORD, R.F.C., is wounded and in German hands. Second Lieutenant E. I. Dunford has been missing since April 11th.

Lieutenant JOHN WILLIAM SHAW, R.F.C., reported missing since a flight over the enemy lines on June 7th, is a prominent Marlow R.C. oarsman. He rowed in the Marlow Eight in the Thames Cup at Henley in 1913 and 1914, this crew winning during those two years challenge cups for eights at the regattas at Walton (twice), Kingston, Reading (twice), Marlow (twice), and Goring and Streatley. Lieutenant Shaw also won several prizes in fours, and was known as a useful sculler.

Married and to be Married.

The engagement is announced between GEOFFREY CAMPBELL BOURNE, Lieutenant, London Regiment, attached R.F.C., younger son of the Rev. C. W. and Mrs. Bourne, of Staplehurst Rectory, Kent, and EILEEN MARY, younger daughter of Dr. and Mrs. EDWARD A. C. BAYLOR, of North Lodge, Ipswich.

On June 21st, by special licence, at Holy Trinity, Sloane Street, Captain JOHN ARTHUR GERALD DE COURCY, M.C., R.F.C., only son of the Hon. C. R. S. and Mrs. de Courcy, and grandson of the late Lord Kingsale, was married to ANNA FELICIA, youngest daughter of the late Hon. Mr. Justice WRIGHT and Mrs. WRIGHT, of Ryecroft, Bray, Co. Wicklow, and granddaughter of the late Sir Croker Barrington, Bt., of Glenstal, Co. Limerick.

On June 14th, at Holy Trinity, Folkestone, Second Lieutenant ERIC FITZGERALD, Yeomanry and R.F.C., was married to EILEEN, youngest daughter of the late Rev. Alex. FREEMAN and Mrs. FREEMAN, 30, Westbourne Gardens, Folkestone.

The marriage arranged between Captain C. DRURY FULLER, Royal Sussex Regiment and R.F.C., and Miss BEATRICE FULTON, daughter of Sir Robert and Lady Fulton, 7, Sloane Gardens, will take place on July 2nd, at Holy Trinity Church, Sloane Street, at 2.15 p.m.

The engagement is announced of Captain R. G. GOULD, M.C., R.F.C., eldest son of Mr. Robert Gould, Pinecroft, Pyrford, Surrey, to MARGARET, second daughter of Mr. WHITNEY MOCKRIDGE, Pine Lodge, West Byfleet, Surrey.

A marriage has been arranged, and will shortly take place, between Captain G. H. HALL, Yeomanry and R.F.C., eldest son of Sir Henry Hall, I.S.O., and Lady Hall, of Chester, and Miss M. G. WELLS-COLE, younger daughter of the late G. F. Wells-Cole and Mrs. Wells-Cole, of Stones Place, Lincoln.

The engagement is announced of LORNA, third daughter of Sir OLIVER and Lady LODGE, and Second Lieutenant ROBERT LANGLEY, R.F.C., eldest son of the Rev. John Langley, Rector of North Wraxall, and Mrs. Langley.

The engagement is announced between Flight-Lieutenant B. CROSSLEY MEATES, R.N., elder son of Mr. and Mrs. H. Meates, Oakland Court, Cheltenham, and FLORENCE LILIAN, only daughter of the late J. G. SEARS and Mrs. SEARS, Collingtree Grange, Northamptonshire.

The marriage between Lieutenant WILLIAM JANSON POTTS, R.F.A., attached R.F.C., only surviving son of the late William Potts and of Mrs. Potts, of Sanderstead Hill, and GLADYS ISABELLE, only child of the late Major F. H. THORNDIKE, 2nd Royal Sussex Regiment, and of Mrs. Thorndike, of Blackheath, will take place at St. Peter's Church, Eltham Road, Lee, S.E., at 2 p.m. on July 14th.

On June 18th, at the Parish Church, Weybridge, Second Lieutenant JOHN SOUTHALL, R.F.C., son of Mr. and Mrs. William Southall, of South Farnborough, Hampshire, was married to MURIEL, elder daughter of Mr. and Mrs. W. DOUGLAS MCWILLIAM, of Cirencester, Gloucestershire.

The marriage arranged between Second Lieutenant GRAHAM STRANG STEEL, R.F.C., only son of the late Thomas Steel, and MARION CHALMERS, only daughter of the Rev. JAMES HENDERSON, will take place at Portsmouth to-day, June 28th.

At All Saints' Church, Battersea Park, on June 6th, Lieutenant E. F. L. TAYLOR, Devon Regiment and R.F.C., son of the Rev. E. F. Taylor, was married to LAURA ROSAMOND GRAHAME-WILLIAMS, eldest daughter of Mr. and Mrs. J. G. Grahame-Williams.

Items.

Captain WEDGWOOD BENN, M.P., former Junior Liberal Whip, who was recently awarded the D.S.O. for his services as an airman, has for the time being withdrawn from Parliamentary and political engagements in order to give himself wholly to his military duties. He is now serving at the Front with the R.N.A.S.

After being a prisoner in Germany for ten months, Captain A. J. EVANS, R.F.C., the Oxford University and Hampshire cricketer, has arrived at his home in Newbury, Berkshire. Captain Evans, who was taken prisoner while on a flying expedition in July, 1916, escaped with another flying officer from a German prison on May 22nd, and 18 days later, after many adventures, reached Berne.

In reference to the accidental death of Second Lieutenant HIGGS, R.F.C., announced in "FLIGHT" on June 14th, we are asked to state that this does not refer to Lieutenant G. W. HIGGS, R.F.C., as a number of the latter's Canadian and other friends in various parts of the world may assume it is Lieutenant G. W. HIGGS who has met with a fatal accident.

Captain CECIL H. C. KEEVIL, West Yorks Regiment, attached R.F.C., son of Mr. R. Keevil, of Clitterhouse Farm, Cricklewood, who died the previous week, was buried on June 19th with full military honours at Hampstead Cemetery. A contingent of the R.F.C. attended, and the coffin, covered with the Union Jack, was conveyed to the cemetery on a gun-carriage.

In pre-war days Mr. ERNEST P. KING, B.Sc. (Eng.), Lond.—whose marriage with ANNIE, eldest daughter of Mr. and Mrs. W. H. WELSH is announced for Saturday, June 30th, at Southfields—was on the teaching staff of one of the London Polytechnics, but in 1915 he obtained leave of absence and joined the A.I.D. Subsequently he turned his attention to the experimental and technical side of aircraft and propeller design.

Lieutenant the Hon. FRANCIS MCLAREN, M.P. for the Spalding Division of Lincolnshire, who was invalided out of the Flying Corps some months ago, and appealed against that decision, has now resumed his military duties in the R.F.C.

Mr. W. A. MEDROW, having served as a clerk of the Second Division for over eight years, has been promoted to the post of Assistant Superintending Clerk in the Air Department of the Admiralty, with a special certificate granted exceptionally by the Civil Service Commissioners.

"X" AIRCRAFT RAIDS.

IN view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

"X 63" Raid (June 13th).

IT was announced by the Secretary of the Press Bureau on June 25th that since the publication on June 14th of the casualties resulting from the air raid of June 13th a number of persons previously reported as injured have died, and several additional bodies have been found in the process of clearing away the débris of damaged premises. The total casualties in all areas now stand as follows:—

Killed: Men, 91; Women, 24; Children, 42. Total, 157.
Injured: Men, 222; Women, 110; Children, 100. Total, 432.

King's Gift for Raid Victims.

THE King has sent a donation of £200 to the fund raised by the Lord Mayor for the sufferers by the recent London air raid. The fund now amounts to over £4,200.

Fatal Accidents.

WHILE flying near Yatesbury on June 8th Lieut. Hoey met with a fatal accident, the machine alighting on the roof of a house. At the inquest it was stated that something went wrong with the controls, causing the deceased to lose control. A verdict of "Accidental Death" was returned.

A verdict of "Accidental Death" was returned at an inquest on June 19th on Lieut. R. H. Herd, R.F.C., who was killed while flying as observer on the South Coast. It was stated that the petrol tank burst and that flames shot 100 ft. into the air.

Lieut. A. Davis, R.F.C., was killed at Yatesbury on June 20th.

A flying accident occurred near Birmingham on June 23rd, two officers of the R.F.C. coming down with a machine which crashed into the corner of a field and turned turtle. Lieut. Jacob was killed. His companion, Lieut. Villiers, was injured and was removed to hospital.

Following injuries received on June 14th, Lieut. H. S. H. Bond, R.F.C., died in the R.F.C. Hospital on June 17th. At the inquest it was stated that after a sham fight Lieut. Bond was gliding down from 4,000 ft., when part of his machine broke, causing the planes to buckle and the machine to spin for 2,900 ft. The pilot appeared to regain control, but the machine then got into a nose-dive, and crashed into a timber yard. A verdict of "Accidental Death" was returned.

The British Air Services

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, June 19th.

The following have been entered as Prob. Flight Officers (Temp.) seniority as follows:—G. R. Hake; May 24th. G. O. Roper, A. Ward and P. W. Inwood; May 21st. J. C. S. Bowden, H. M. O'Loughlin, W. F. Gibson, H. A. Reeves, H. R. Mayes, R. L. Johns, J. H. Taylor, G. R. J. Parkinson, A. D. E. Selby, E. F. Bensly, G. M. Carmel, R. Coulthard, R. M. Denholm, T.C. Gordon, F. Kemp, H. F. L. Mavity, G. A. Pitt. M. H. Press, W. Pryor, R. Robinson, A. P. Squire and G. E. Taylor; all June 10th.

E. H. Nurse and J. E. Davis, both granted temp. commissions as Sub-Lieut. (R.N.V.R.), seniority; June 18th.

Admiralty, June 20th.

R. C. Berlyn, entered as Prob. Flight Officer (Temp.), seniority, June 10th, and appointed to "President," additional, for R.N.A.S.

Temp. commissions as Lieut. (R.N.V.R.) have been granted to J. R. Gibb and F. J. R. Macfadyen, seniority, respectively, June 19th and July 1st, and both appointed to "President," additional, for R.N.A.S.

Admiralty, June 21st.

C.P.O. F. H. Rowan, granted a temp. commission as Sub-Lieut. (R.N.V.R.) seniority, July 14th.

Admiralty, June 22nd.

B. A. Simson entered as Prob. Flight Officer (Temp.), seniority April 17th.

L. D. Henderson and N. H. Jenkins, both entered as Prob. Ob. Officers (Temp.) and J. R. S. Young entered as Prob. Ob. Officer, all seniority July 14th.

Temp. commissions as Lieut. (R.N.V.R.) and Sub-Lieut. (R.N.V.R.) respectively have been granted to W. H. Fenteman-Coates and H. H. E. Osborn, seniority, June 21st.

Admiralty, June 23rd.

Temp. Sub-Lieut. (R.N.V.R.) F. Smith, promoted to Lieut. (Temp.), seniority June 20th.

C. M. Attlee entered as Prob. Ob. Officer (Temp.), seniority June 22nd, and appointed to "President," additional for R.N.A.S.

Temp commissions. (R.N.V.R.) have been granted to the following, seniority as stated:—Lieuts.: G. M. Butler; June 21st. H. Burgess and J. Gibson; June 22nd, and all appointed to "President," additional, for R.N.A.S.; T. E. Grant; June 22nd, and appointed to "President," for R.N.A.S. Sub-Lieut.: W. Hall; June 22nd, and appointed to "President," additional, for R.N.A.S.

Royal Flying Corps (Military Wing).

London Gazette, June 19th.

Flight Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed: 2nd Lieut. N. B. Hair, S.R.; May 31st. Temp. Lieut. H. L. Satchell, attd. R.War.R., and to be transfd. to Gen. List; Temp. 2nd Lieut. A. C. Randall, Gen. List; 2nd Lieut. L. M. Mansbridge, Dorset R.; June 3rd. Temp. 2nd Lieut. H. P. Rushforth, Gen. List (June 4th).

Flying Officers.—Temp. 2nd Lieut. L. H. Thierry, attd. Manch. R., and to be transfd. to Gen. List; March 5th. Temp. Lieut. B. S. S. Rockey, R.E.; April 10th. Temp. 2nd Lieut. G. N. Goldie, Gen. List, from a Flying Officer (Ob.), April 13th, seniority Sept. 16th, 1916. Temp. 2nd Lieut. C. Ryder, Gen. List; April 21st. Temp. 2nd Lieut. W. B. Thomson, Gen. List; May 4th. 2nd Lieut. F. M. Sellars, Newfoundland R.; May 19th. 2nd Lieut. K. R. Park, R.A., and to be secd.; May 23rd. Temp. 2nd Lieut. (on prob.) J. S. Wood, Gen. List; Temp. 2nd Lieut. (on prob.) J. K. Chatham, Gen. List; May 24th. Temp. Capt. W. P. Horsley, M.C., Gen. List; 2nd Lieut. (Temp. Capt.) H. Baring, R.W. Kent R., T.F., and to be secd.; Lieut. G. A. H. Trudeau, R. Canadian Reg., from a Flying Officer (Ob.), with seniority from April 30th, 1916; Temp. 2nd Lieut. (Temp. Lieut.) R. M. Collingwood, Gen. List, from a Flying Officer (Ob.), with seniority from June 19th, 1916; May 26th. Temp. 2nd Lieut. (on prob.) G. N. Prout, Gen. List; Temp. 2nd Lieut. H. D. A. Dart, A.S.C., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) P. C. Felts, Gen. List; 2nd Lieut. G. B. MacQuarrie, S.R.; 2nd Lieut. C. W. Davies, S.R.; Temp. 2nd Lieut. (on prob.) V. C. Coombs, Gen. List (May 28th;. Temp. 2nd Lieut. V. M. de Balabre, North'd Fus., attd. A. Cyclist C., and to be transfd. to Gen. List; May 29th. 2nd Lieut. J. W. Greenshields, Essex R., T.F., and to be secd.; Temp. 2nd Lieut. (on prob.) H. R. Hodgson, Gen. List; May 30th. 2nd Lieut. H. D. Lyons, R.A., and to be secd.; May 31st.

Memoranda.—Temp. 2nd Lieut. J. H. Cock, Gen. List, to be Temp. Lieut. for duty with R.F.C.; April 4th.

To be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: W. W. Sayer, Feb. 3rd. F. A. Mills; May 30th. E. E. Johnson; June 1st.

Special Reserve of Officers.—The following, from an Officer Cadet Unit, to be 2nd Lieuts. (on prob.), June 7th: F. B. Fitzner, F. A. Trotter.

London Gazette Supplement, June 20th.

The following to be Temp. 2nd Lieut., Corps of Royal Engineers: 2nd Air-Mech. H. C. Gray, from R.F.C.; May 12th.

Staff Officers, 1st Class (graded for pay as a General Staff Officer, 1st Grade, at the War Office).—Lieut. (Temp. Major) B. S. Foster, Hamps. R. (T.F.), from a Special Appointment (graded as a Park Comdr.), and to be Temp. Lieut.-Col. whilst so employed; May 17th.

3rd Class (graded for pay as a General Staff Officer, 3rd Grade, at the War Office).—Lieut. (Temp. Capt.) J. H. Simpson, S.R., from a Flight-Comdr., and to retain his temp. rank whilst so employed; May 17th.

Flying Officers.—2nd Lieut. J. K. von I. Peden, R.F.A. (T.F.), and to be secd.; Mar. 28th. 2nd Lieut. W. H. Howell, Essex R. (T.F.), and to be secd.; Mar. 29th. 2nd Lieut. W. E. Nicholson, Yeo. (T.F.), and to be secd.; May 1st. Temp. Capt. E. W. S. Cotterill, attd. R. Fus., and to be transfd. to Gen. List; May 4th. Lieut. W. C. Moore, A.S.C. (T.F.); May 5th. Temp. 2nd Lieut. (on prob.) F. H. St. C. Sargant, Gen. List; May 7th. Temp. 2nd Lieut. (on prob.) L. Playne, Gen. List; Temp. 2nd Lieut. (on prob.) H. G. Reeves, Gen. List; May 19th. Temp. 2nd Lieut. (on prob.) R. S. Lloyd, Gen. List; May 20th. Temp. Lieut. E. Leighton, Gen. List; Temp. 2nd Lieut. (on prob.) T. M. McFerran, Gen. List; May 22nd. Temp. 2nd Lieut. (on prob.) J. R. Preece, Gen. List; May 23rd. Temp. 2nd Lieut. (on prob.) J. A. B. Colin, Gen. List; May 24th. Temp. 2nd Lieut. S. B. Martin, Gen. List; 2nd Lieut. F. W. Rook, S.R.; Temp. 2nd Lieut. (on prob.) E. G. Nuding, Gen. List; 2nd Lieut. A. B. Hill, S.R.; May 25th. Temp. 2nd Lieut. D. H. S. Gilbertson, North'n. R., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) J. Handley, Gen. List; 2nd Lieut. (on prob.) T. H. Barton, S.R.; May 26th. 2nd Lieut. (on prob.) H. J. Thornton, S.R.; May 27th. Temp. Lieut. C. G. Rushton, Gen. List, from a Flying Officer (Ob.), seniority May 8th, 1916; 2nd Lieut. W. S. Mansell, E. Surr. R., S.R., from a Flying Officer (Ob.), seniority June 20th, 1916; Temp. 2nd Lieut. F. V. Tattersall, attd. R.W. Surr. R., and to be transfd. to Gen. List; 2nd Lieut. J. V. R. Brown, Arg. and Suth'd. Highrs. (T.F.), and to be secd.; Temp. 2nd Lieut. J. E. Bonniksen, Gen. List; 2nd Lieut. (on prob.) R. W. Makepeace, S.R.; Temp. 2nd Lieut. O. H. D. Vickers, Gen. List; Temp. 2nd Lieut. (on prob.) J. H. Tudhope, Gen. List; May 29th. 2nd Lieut (on prob.) G. V. Walsh, S.R.; Temp. 2nd Lieut. (on prob.) L. F. Wheeler, Gen. List; 2nd Lieut. (on prob.) C. C. Caldwell, S.R.; Temp. 2nd Lieut. (on prob.) C. Pinnock, Gen. List; May 30th. The date of the appointment of the following Officers is as now stated, and not as in the *Gazette* of May 25th: Lieut. R. A. Maybery, Lrs.; April 11th. Temp. Lieut. D. S. Wilkinson, Cam'n. Highrs.; April 13th. The date of seniority of 2nd Lieut. (Temp. Lieut.) C. R. Robbins, M.C., R.A., is Dec. 26th, 1915 and not as in *Gazette* of May 2nd.

Flying Officers (Observers).—2nd Lieut. S. W. Brown, R.F.A. (T.F.) (since killed in action); April 5th, 1916 (substituted for notification in the *Gazette* of Jan. 1st). 2nd Lieut. T.M. McKenna, Hrs., S.R.; Aug. 23rd, seniority Jan. 3rd. 1916. Temp. Lieut. G. L. Moss, M.C., Leins. R., and to be transfd. to Gen. List; May 30th, seniority Jan. 1st. 2nd Lieut. J. K. Aitken, Arg. and Suth'd. Highrs. (T.F.), and to be secd.; May 29th, seniority Jan. 30th. 2nd Lieut. S. E. Toomer, R.G.A., S.R., seniority Feb. 13th; Temp. 2nd Lieut. C. R. Strudwick, attd. Ches. R., seniority Feb. 15th, and to be transfd. to Gen. List; Lieut. W. S. Harms, Essex R., S.R., and to be secd.; May 29th, seniority Feb. 23rd. Lieut. R. M. McDonald, Can. Gen. List, seniority Mar. 20th; Capt. W. P. Spero, Can. Gen. List, seniority April 23rd; May 30th. The date of seniority of Temp. 2nd Lieut. H. L. Waddington, Gen. List, is Nov. 22nd, 1916, and not as in the *Gazette* of Mar. 22nd.

Balloon Officers.—2nd Lieut. (Temp. Capt.) H. A. Laycock, Durh. L.I. (T.F.), and to be secd.; Temp. 2nd Lieut. (on prob.) H. G. L. Thompson, Gen. List 2nd Lieut. S. Norman, Lond. R. (T.F.), and to be secd.; May 30th.

Equipment Officers, 2nd Class.—From the 3rd Cl.: 2nd Lieut. W. H. Clover, and to be Temp. Lieut. whilst so employed; April 1st. Lieut. W. J. King, S.R.; Lieut. J. F. Luscombe, S.R.; May 1st. From the 3rd Cl., and to be Temp. Lieuts. whilst so employed: Temp. 2nd Lieut. L. Norris, Gen. List; 2nd Lieut. A. W. Payne, S.R.; May 5th. From the 3rd Cl.: Lieut. W. C. Green, S.R.; 2nd Lieut. O. Lindquist, S.R., and to be Temp. Lieut. whilst so employed; May 15th. Lieut. T. W. Tattersall, S.R.; May 24th. Temp. Lieut. H. F. Bradley, Gen. List; 2nd Lieut. W. F. Bryant, R.W. Surr. R., and to be Temp. Lieut. whilst so employed; May 29th. Lieut. E. W. Vaughan, S.R. From the 3rd Cl., and to be Temp. Lieuts. whilst so employed: 2nd Lieut. C. T. Inman, S.R.; 2nd Lieut. H. R. Spence, S.R.; June 1st. Temp. Lieut. J. P. Ross, Gen. List, from the 3rd Cl.; May 25th. 3rd Cl.: Temp. Capt. R. C. Fowler, North'n. R., and to be transfd. to Gen. List; April 14th. Temp. 2nd Lieut. L. J. E. Genner, Gen. List, from a Flying Officer; June 4th. The appointment of 2nd Lieut. W. W. Hammond, S.R., notified in the *Gazette* of May 21st, is ante-dated to April 20th. Temp. Lieut. V. E. Faning, Gen. List reverts from the 2nd Cl. at his own request; May 25th.

Schools of Instruction.—Schools of Military Aeronautics.

Assistant Instructors (graded as Equipment Officers, 2nd Class).—Lieut. A. H. L. Beale, S.R., an Equipment Officer, 3rd Cl.; 2nd Lieut. F. T. McElwee, an Equipment Officer, 3rd Cl., and to be Temp. Lieut. whilst so employed; May 26th.

Memoranda.—To be Temp. Lieut.: Sub-Lieut. E. Leighton, from R.N.V.R. for duty with R.F.C.; May 22nd. Actg. Sergt.-Major O. T. Stone, from R.F.C., to be 2nd Lieut. for duty with R.F.C.; June 6th. G. H. Wiggins to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C.: May 11th.

Supplementary to Regular Corps.—2nd Lieut. H. G. H. MacSwiney resigns his commission; June 21st.

London Gazette Supplement, June 21st.

Flying Officers.—Lieut. A. B. Jarvis, Middx. R. (T.F.), from a Flying Officer (Ob.); April 2nd, seniority July 2nd 1916. Lieut. K. S. Morrison, R.F.A., S.R.; 2nd Lieut. J. McL. Pearson, Sco. Rif. (T.F.), and to be secd.; May 5th. Temp. 2nd Lieut. G. F. W. Zimmer, attd. R. Berks. R., and to be transfd. to Gen. List; May 6th. 2nd Lieut. B. B. Buxton, Norf. R. (T.F.), and to be secd.; May 7th. 2nd Lieut. (Temp. Lieut.) E. D. Hall, North'd. Fus. (T.F.), and to be secd.; 2nd Lieut. W. J. Kene, Lond. R. (T.F.), and to be secd.; 2nd Lieut. (on prob.) F. Scarborough, S.R.; Temp. 2nd Lieut. (on prob.) J. R. Cudemore, Gen. List; May 12th. 2nd Lieut. A. Walsh, E. Lan. R. (T.F.) and to be secd.; May 16th. 2nd Lieut. W. F. E. de B. MacLaren L'pool. R. (T.F.), and to be secd.; May 19th. Temp. 2nd Lieut. E. T. Smith, attd. R.W. Surr. R., and to be transfd. to Gen. List; 2nd Lieut. (on prob.) C. B. Van Leenof, S.R.; Temp. 2nd Lieut. (on prob.) E. F. Haselden, Gen. List; May 23rd. Temp. 2nd Lieut. C. A. B. B. Wilcock, attd. R.W. Surr. R., and to be transfd. to Gen. List; May 26th. Temp. 2nd Lieut. J. G. O'Giollagain, Gen. List; May 29th. 2nd Lieut. N. S. Paynter, Essex R., and to be secd.; Temp. 2nd Lieut. (on prob.) F. Worswick, Gen. List; 2nd Lieut. G. P. Wakeham, Yeo. (T.F.), and to be secd.; 2nd Lieut. (on prob.) J. L. Drummond, S.R.; May 30th. Temp. Lieut. L. Reynolds, Gen. List, from a Flying Officer (Ob.), seniority Feb. 24th, 1916. 2nd Lieut. D. Alliban, Notts. and Derby. R., S.R., and to be secd.; Temp. 2nd Lieut. (on prob.) W. E. Warden, Gen. List; Temp. Lieut. G. S. Tomlin, attd. Welsh R., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) J. E. C. MacVicker, Gen. List; Temp. 2nd Lieut. (on prob.) W. Walker, Gen. List; 2nd Lieut. (on prob.) F. P. Watts, S.R.; May 31st. 2nd Lieut. (Temp. Lieut.) A. J. Bott, M.C., R.G.A., S.R., from a Flying Officer (Ob.), seniority July 2nd, 1916. Temp. 2nd Lieut. F. H. Bickerton, Gen. List, from a Flying Officer (Ob.), seniority May 11th, 1916; Temp. 2nd Lieut. M. P. Lewis, attd. Ches. R., and to be transfd. to Gen. List; Temp. 2nd Lieut. E. J. Brown, Gen. List; 2nd Lieut. (on prob.) S. J. Gardiner, S.R.; Lieut. W. W. Watson, Can. Gen. List; 2nd Lieut. (on prob.) R. H. Richardson, S.R.; 2nd Lieut. (on prob.) T. W. Kerr, S.R.; Temp. 2nd Lieut. (on prob.) H. D. Layfield, Gen. List; Temp. 2nd Lieut. C. W. Adkin, Gen. List; from a Flying Officer (Ob.), seniority July 7th, 1916; Temp. 2nd Lieut. (on prob.) W. C. Smith, Gen. List; Temp. Lieut. R. E. Casalis de Pury, R.A., and to be transfd. to Gen. List; June 1st. Temp. 2nd Lieut. L. C. Jarrett, attd. R. W. Kent R., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) W. A. Pritt, Gen. List; June 2nd. 2nd Lieut. (on prob.) E. D. Perney, S.R.; June 4th. 2nd Lieut. E. M. Sant, Essex R., S.R., and to be secd.; Temp. 2nd Lieut. (on prob.) H. A. Hope, Gen. List; Temp. 2nd Lieut. (on prob.) G. Sulman, Gen. List; June 5th. Temp. 2nd Lieut. R. F. Round, Gen. List; June 8th.

Flying Officers (Observers).—Temp. 2nd Lieut. I. L. Pinson, S. Staff. R., and to be transfd. to Gen. List; May 3rd, seniority Jan. 24th. 2nd Lieut. J. C. Day, R. Suss. R., S.R., and to be secd.; May 8th, seniority Jan. 24th. Temp. Lieut. B. L. Franklin, Middx. R., and to be transfd. to Gen. List; May 3rd, seniority Feb. 9th. Lieut. (Actg. Capt.) F. E. Elliot, R.A., and to be secd.;

May 2nd, seniority Feb. 11th. Temp. 2nd Lieut. C. W. Lane, K.R. Rif. C., and to be transfd. to Gen. List; May 8th, seniorty Feb. 14th. 2nd Lieut. P. S. Laughton. N. Staff. R., and to be secd.; May 1st, seniority Feb. 15th. 2nd Lieut. N. Butterworth, Manch. R. (T.F.), and to be secd.; May 8th, seniority Mar. 2nd; Temp. 2nd Lieut. H. L. Tomkies, Notts. and Derby. R., and to be transfd. to Gen. List; April 24th, seniority Mar. 9th. Temp. 2nd Lieut. (on prob.) E. S. Moore, Gen. List; May 10th, seniority Mar. 9th, Lieut. B. A. Wilson, Can. Art.; May 6th, seniority April 14th.

Equipment Officers, 3rd Class.—Lieut. J. C. Snelgrove, Can. Exp. Force; April 12th. 2nd Lieut. (on prob.) A. McD. Hamilton, S.R.; April 24th. Lieut. R. K. Armstrong, Can. Field Art.; April 25th. 2nd Lieut. (on prob.) J. L. Cuthbertson, S.R.; April 30th. Lieut. J. P. Francis, Can. Militia; May 2nd. 2nd Lieut. (on prob.) C. D. Fairweather, S.R.; May 13th.

Memoranda.—Sergeants, from R.F.C., to be Temp. 2nd Lieuts. for duty with the Mil. Wing of that Corps: J. G. O'Giollagain; May 29th. R. F. Round; June 8th.

To be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: P. W. Paddon; June 1st. W. S. S. Rawson, late 2nd Lieut., Cyclist Co. (T.F.); June 8th.

Supplementary to Regular Corps.—Lieut. (Temp. Capt.) H. Tomlinson, M.C. to be Capt.; April 1st, in his original order of seniority.

2nd Lieut. (on prob.) P. V. Baines resigns his commission; June 22nd.

London Gazette, June 22nd.

Staff Officer, 3rd Class (Graded for pay as a G.S.O., 3rd Grade, at the War Office).—Capt. S. O. Everitt, Res. of Off., from an Adjt.; May 17th.

Flying Officers.—2nd Lieut. (on prob.) I. M. McLean, S.R.; April 18th. Temp 2nd Lieut. D. G. C. Wakeham, A. Cyclist Corps, and to be transfd. to Gen. List.; 2nd Lieut. H. P. Robotham, Glouc. R., S.R., and to be secd.; 2nd Lieut. (Temp. Capt.) B. E. Sutton, Yeo., T.F., from a Flying Officer (Ob.) (May 5th, seniority Feb. 2nd, 1916); May 2nd. 2nd Lieut. P. E. Wood, K.O. Sco. Bord., T.F., and to be secd.; 2nd Lieut. R. G. Taylor, K.O. Sco. Bord., T.F., and to be secd.; May 15th. 2nd Lieut. J. Hyslop, K.O. Sco. Bord., T.F., and to be secd.; May 18th. Temp. 2nd Lieut. (on prob.) N. V. Harrison, Gen. List; May 30th. 2nd Lieut. F. W. Clarke, Yeo., T.F., and to be secd. Temp. 2nd Lieut. (on prob.) A. A. Shaw, Gen. List; Temp. 2nd Lieut. A. C. Pickett, attd. North. R., and to be transfd. to Gen. List; 2nd Lieut. (on prob.) C. M. Ross, S.R.; May 31st. 2nd Lieut. (on Prob.) D. R. Munro, S.R.; Temp. 2nd Lieut. (on Prob.) J. Adam, Gen. List; Temp. 2nd Lieut. (on prob.) K. Le G. Mills, Gen. List; Temp. Sec. Lieut. H. K. Knight, R. Suss. R., and to be transfd. to Gen. List; 2nd Lieut. A. H. G. Dunkerley, Arg. and Suthd. Highrs., T.F., and to be secd.; 2nd Lieut. (on prob.) N. A. Burritt, S.R.; 2nd Lieut. (on prob.) J. L. Boles, S.R.; June 2nd. 2nd Lieut. C. R. Gaffney, Liverp. R., T.F., and to be secd.; Temp. 2nd Lieut. (on prob.) H. N. Hampton, Gen. List; Temp. 2nd Lieut. (on prob.) E. Vredenburg, Gen. List; 2nd Lieut. (on prob.) A. R. Holthouse, S.R.; June 3rd. Temp. 2nd Lieut. (on prob.) E. S. Weiss, Gen. List; Temp 2nd Lieut. (on prob.) F. G. Jones, Gen. List; Temp. 2nd Lieut. (on prob.) S. P. Ball, Gen. List; 2nd Lieut. P. M. McSwiny, Ind. Inf.; 2nd Lieut. (on prob.) C. H. F. Nobbs, S.R.; June 4th. 2nd Lieut. A. N. Dupont, Leic. R., T.F., and to be secd.; June 5th.

Flying Officers (Observers).—Temp. 2nd Lieut. (on prob.) J. Gagne, Gen. List; May 23rd, seniority Nov. 16th. Temp. 2nd Lieut. R. Q. Thomas, R.A., and to be transfd. to Gen. List; May 13th, seniority Dec. 16th. Temp. 2nd Lieut. O. R. Kelly, North'd. Fus., and to be transfd. to Gen. List; May 11th, seniority Jan. 19th. 2nd Lieut. S. F. Ireland, Yeo. (T.F.), and to be secd.; June 3rd, seniority Jan. 29th. Lieut. C. P. Harding, M.C., Ches. R., and to be secd.; April 30th, seniority Feb. 11th. Temp. 2nd Lieut. R. Hayes, S. Lan. R., and to be transfd. to Gen. List; June 3rd, seniority Mar. 8th. 2nd Lieut. E. L. Edwards, Welsh R., and to be secd.; April 30th, seniority April 8th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. E. W. M. Tomlinson, Gen. List; April 17th. Temp. 2nd Lieut. L. F. Bishop, Gen. List; May 3rd. 2nd Lieut. (on prob.) L. R. Howland, S.R.; May 7th. Temp. Lieut. G. H. L. Sweet, North'd. Fus.; May 24th. 2nd Lieut. (on prob.) A. H. Comfort, S.R. June 1st.

Memoranda.—Sergt. E. E. Jolly, from R.F.C., to be Temp. 2nd Lieut. (on prob.), for duty with the Mil. Wing of that Corps; June 11th.

Supplementary to Regular Corps.—The following 2nd Lieuts. (on prob.) are confirmed in their rank: J. McF. Stewart, L. Read, H. P. Beasley, C. F. Gorringe, H. J. Thornton, G. T. W. Burkett, A. Macdonald, C. C. Caldwell, P. H. Harbutt, T. Campbell, D. H. Kemp, T. A. Russell, H. K. Fairbrother, E. P. Spriggs, J. R. Sykes, A. E. Rampton, W. Searle, R. J. Shanks, P. E. Scrivener, F. S. Coghill, P. J. Moloney, E. H. Garland, B. B. Perry, N. S. Cameron, J. E. Dawes, A. C. Nixon, W. Brackenbury, E. E. Amoore, F. Walters, V. M. Adams, I. Massey, E. A. Masters, D. Low, C. B. Hudson, L. E. Heathe, C. G. Walton, H. A. Scott, A. L. Freeman, C. D. Clarke, A. W. B. Medhurst.

London Gazette Supplement, June 23rd.

Flying Officers.—Temp. 2nd Lieut. G. A. S. Nicholson, attd. R. Highrs., and to be transfd. to Gen. List; Temp. 2nd Lieut. R. A. Cotman, Essex R., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) F. A. Watson, Gen. List; May 29th. Temp. 2nd Lieut. (on prob.) G. S. Wood, Gen. List May 30th. Temp. 2nd Lieut. (on prob.) C. T. Lovell, Gen. List; May 31st.

Flying Officers (Observers).—2nd Lieut. L. Stockton-Smith, N. Staff. R., S.R.; seniority Dec. 29th, and to be secd.; Temp. 2nd Lieut. J. R. Currington, attd. Linc. R., seniority Jan. 8th, and to be transfd. to Gen. List; June 4th. Temp. 2nd Lieut. J. E. Price, R. W. Fus., and to be transfd. to Gen. List; June 5th, seniority Jan. 25th. 2nd Lieut. W. A. Strickland, Middx. R., S.R., from N. Lan. R., seniority from Jan. 29th, and to be secd.; Temp. 2nd Lieut. J. J. Gaynor, R.A., seniority Feb. 21st, and to be transfd. to Gen. List; 2nd Lieut. D. S. Judson, Lond. R. (T.F.), seniority Feb. 23rd, and to be secd.; Lieut. R. M. Grant, Can. Gen. List; April 8th, seniority Mar. 26th; June 4th.

London Gazette Supplement, June 25th.

Flight-Commander.—2nd Lieut. (Temp. Capt.) B. E. Sutton, M.C., Yeo. (T.F.), from a Flying Officer; May 6th.

Flying Officers.—Temp. 2nd Lieut. A. P. Boor, Oxf. and Bucks L.I., and to be transfd. to Gen. List; April 2nd. Temp. 2nd Lieut. (on prob.) A. D. Makins, Gen. List; May 1st. Temp. 2nd Lieut. C. H. Marchant, Gen. List, from a Flying Officer (Ob.); May 26th, seniority Aug. 25th. Temp. 2nd Lieut. J. G. Coombe, Gen. List, from a Flying Officer (Ob.); May 29th, seniority May 14th, 1916. Temp. Lieut. R. Affleck, Gen. List, from a Flying Officer (Ob.); June 3rd, seniority Aug. 10th.

Flying Officers (Observers).—June 6th, seniority Mar. 8th: Temp. 2nd Lieut. L. Miller, Army Cyclist Corps, and to be transfd. to Gen. List; Temp. 2nd Lieut. A. D. Taylor, Gen. List.

Memoranda.—To be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: W. S. Vale; June 4th. C. Jackson, late Capt., Australian Inf.; June 8th.

2nd Cl. Air-Mech. L. E. S. G. Baron Garvagh, from R.F.C., to be Temp. 2nd Lieut. (on prob.) for duty with Mil. Wing of that Corps; June 6th.

To be Temp. 2nd Lieut.: 2nd Lieut. D. Brooks, from R.F.C., S.R., for employment on recruiting duties; May 1st, seniority Aug. 26th, 1915.

Aeronautical Inspection Department.

London Gazette Supplement, June 20th.

H. B. Hitch to be Temp. Hon. Lieut. (without pay or allowances of that rank) whilst employed as an Asst. Inspr. in the Aeronautical Inspn. Dept.: June 1st.

IN PARLIAMENT.

Air Patrols for London.

MR. STANTON, in the House of Commons, on June 19th, asked the Parliamentary representative of the Air Board, if he will at once establish regular air patrols in defence of London and other large towns; if he is aware that Paris has been free from German air raids since the French air ministry established such patrols many months ago; and will he do it now and thereby stop the possibility of further enemy raids and loss of life?

Mr. Macpherson: I must point out to my hon. Friend that it is most undesirable to discuss the methods of aerial defence adopted either in this country or in France, as it leads to the disclosure of valuable information to the enemy, but I can assure him that the subject is constantly engaging the attention of the highest military experts and that everything possible is being done to deal effectively with the situation.

Mr. Rowlands: May I ask whether the same course has been taken with regard to the home counties which suffered?

Mr. Macpherson: Yes.

The Defence of London.

MR. LYNCH asked the First Lord of the Admiralty who is responsible for the defences of London against aircraft; whether at any time the anti-aircraft guns have ever brought down either a Zeppelin or an aeroplane; and whether any change is contemplated in regard to the higher direction of the Department concerned?

Mr. Macpherson: The Field Marshal Commanding-in-Chief, Home Forces, is responsible for the defence of London against aircraft attack. The answer to the second part of the question is in the affirmative in both cases. On 5th June two enemy aeroplanes were shot down by the anti-aircraft gun defences. With regard to the last part, no change is contemplated in regard to the higher direction of anti-aircraft defence.

Mr. Lynch: Does the hon. Gentleman say that the Zeppelins were shot down by guns?

Compensation for Raid Victims.

MR. HOGGE asked the Prime Minister whether, in view of the casualties in the recent raid, the Government are now prepared to recognise that the dependants of those killed should be made eligible for pension; and whether the Government is prepared to submit proposals to the House which will be applicable to the dependants of the victims of air raids?

Mr. Bonar Law: I think this subject does call for further consideration, and I am having it looked into.

Mr. Hogge: When may I expect to hear something?

Mr. Bonar Law: I am trying to get the facts as quickly as possible.

Prisoners in Unfortified Towns.

COLONEL WEIGALL, on June 20th, asked the Prime Minister whether the Government will consider the advisability of placing German prisoners of war in the unfortified towns in the Isle of Thanet in view of the fact that British prisoners are now in Karlsruhe and Freiburg?

The Chancellor of the Exchequer (Mr. Bonar Law): The Government are not prepared to adopt the course suggested by the hon. Member.

Civil Aerial Committee.

CAPTAIN BURGOYNE, on June 21st, asked the Prime Minister when it is proposed to announce the appointment of the successor to Lord Northcliffe in the chairmanship of the Civil Aerial Committee?

Mr. Bonar Law: An announcement will be made at an early date.

Mr. P. A. Harris: Will Lord Northcliffe's absence in America be so permanent that he will not be able to resume his position as Chairman of that Committee?

Fatalities to School Children.

SIR HENRY CRAIK asked the President of the Board of Education if he can now make any statement as to the result of his inquiries into the circumstances attending the fatalities to school children in the recent air raid, as to the experiences of the teachers, and as to the measures taken to secure first aid?

The President of the Board of Education (Mr. Herbert Fisher): I have visited the School and have seen the teachers concerned. I am informed that the casualties on each floor of the building were as follows:—

Second floor, girls' department—1 killed, 3 injured.
First floor, boys' department—1 killed, 15 injured.
Ground floor, infants' department—16 killed, 27 injured.

am glad to say that in the majority of cases the injuries were only slight.

The behaviour of the children and the teachers was admirable and there was no panic. The question as to what further precautions should be taken in the schools against air raids is receiving my careful attention, and I am obtaining expert advice in the matter.

Defence of London.

MR. LYNCH asked the Under-Secretary of State for War whether he can name the date on which any aeroplane or any Zeppelin has been brought down by the anti-aircraft guns of London, as apart from attack by aeroplanes; and whether the War Office is satisfied with the present range-finders, guns and the general conduct of the defence of London?

Mr. Macpherson: No hostile aeroplane has been shot down by the anti-aircraft guns of London. A Zeppelin was shot down on March 31st, 1916, and another one on September 24th, 1916, by these guns. The War Office is never satisfied as long as improvement is possible; the anti-aircraft defences of London as well as those of the remainder of the country are constantly being improved.

Transfers from the R.F.C.

MR. T. WILSON asked the Under-Secretary of State for War whether Class A men who joined the Royal Flying Corps twelve and eighteen months ago with the understanding that they would be retained in that branch of the Service, are now being transferred without their consent to infantry regiments?

Mr. Macpherson: A considerable number of Class A men, whose trade skill was not such as to make them indispensable have been transferred to other arms.

FLIGHT

THE WORLD'S AIR ROUTES AND THEIR REGULATION.*

By Colonel LORD MONTAGU OF BEAULIEU, C.S.I., F.R.Met.Soc., A.I.M.E.,
Advising Mechanical Inspector to the Government of India.

THOUGH the time has not yet come when regular postal and commercial communication by means of the air is established, there are many signs that after the war an effort will be made by all civilised nations to develop this aspect of flying, as foreshadowed by Mr. Holt Thomas in his recent lecture. It follows, therefore, that already there is need for consideration of the problems of how official, private and commercial flying must be regulated in a national and international sense. Moreover, it is important that the principles governing the regulation of such traffic should be agreed upon and established before the traffic itself actually comes into existence, when awkward precedents may have arisen leading to unsound ideas being adopted, which should be opposed in the interests of efficiency and order.

International and National Legislation.

There has, so far, been no international conference to deal with the problems which concern world flying, but it may be mentioned that in 1899 it was agreed at that now discredited body, the Hague Convention, that no bombs or explosive missiles might be dropped from aircraft. A year or two later, however, Germany and France signified that they could no longer adhere to this undertaking, though Great Britain still remained bound, not having signified dissent. Now the bombardment by aircraft of points of naval and military importance, and of undefended towns as well, has become a matter of daily occurrence, and the resolution of the Hague Convention remains an interesting relic of the past, and the moral it conveys is plain. This is not the place to discuss how far the dropping of bombs by aeroplanes upon towns—whether of military, partly military, or non-military character—will influence the course of war; but without going deeply into this interesting phase of the subject, I may assert that if all an enemy's country is to be considered liable to attack from the air, the cherished privileges hitherto granted to the non-combatant population are at an end. In future civilians, whether men, women or children, will be subjected to a considerable and increasing proportion of the risks formerly borne by the soldier alone. As a matter of fact this is no new development in one sense, for a besieged city shelled by the long-range guns of the enemy has never had such immunity. The bomb-carrying aeroplane, being for this purpose a long-range gun, is merely following the example of its more or less stationary predecessor on the ground, with a much more limited range.

The International Aeronautical Conference which sat at Nancy in 1899 decided that only warfare could reveal the abuses to which the aeroplane could be put. This conclusion was prophetic and eminently true; there have been plenty of such revelations lately.

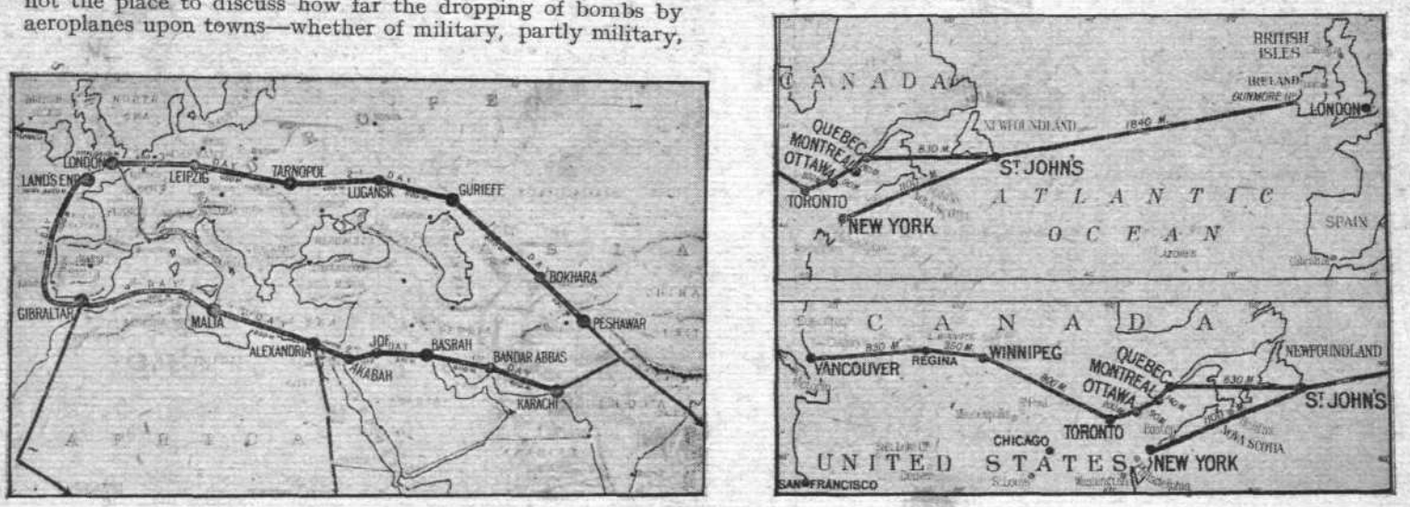
As regards national legislation on the subject, Parliament passed a law, which came into operation in 1913, prohibiting flying over certain areas of naval and military importance, and stipulating that foreign pilots alighting in this country from abroad should descend in certain specified areas, after giving 18 hours' notice in advance to the Home Office of their intended flight. Germans of late have had the hardihood to ignore this statute.

So far as international law is at present concerned, there can be no private or national rights in the air over the sea beyond the three-mile limit. Over the land, by the law of England, it is held that private property extends *usque ad cœlum*—that is, the possession of a piece of land carries with it rights to the sky above the same area. National air rights, therefore, presumably extend all over the land of any nation, and in the case of countries with a sea-board there must be added the fringe of the three-mile limit round the coast.

The Position of the British Empire.

The British Empire is in a peculiarly favourable position for the development of Imperial aviation, for our widely separated possessions will enable our air traffic round the world, over land and sea, to proceed without having to ask for concessions from other nations. The very scattered nature of the Empire in this matter is an advantage, and the Central European Powers will lose presently the advantages of their compactness. The importance of harbours and coaling stations under the British flag all over the world in the past to our naval forces and to our mercantile marine has been very great. But in future still more important will be a chain of landing places for both land and sea planes, and, for the latter, sheltered harbours will be as necessary and valuable for the development of our air services by sea as flat alighting grounds on the land for land machines.

When the map of the world is studied, it is interesting to observe that, with a few exceptions, our possessions are conveniently situated for flying. There is a chain of imperial landing places southward and eastward from Gibraltar, about 900 miles from London as the plane flies, towards the Cape, to Egypt, India and the Australasian Dominions. The nearest points between the North American Continent and Europe, the West Coast of Ireland and the East Coast of Newfoundland, are also both within the Empire.



The World's Air Routes and their Regulation.

Routes and Winds.

For some time to come flying will be more easy over the land than over the sea, owing to the existence of well-organised landing places at every 10, 15 or 20 miles. Over the sea flying must be more difficult and dangerous to start with until the absolutely reliable engine is available and the movement of storms and the circulation of winds have been studied and their behaviour can be forecasted accurately. In any case, I think it is unlikely that straight-line routes between place and place will be those that will ordinarily be adopted. In the air the currents of wind are not only far swifter than in the case of those of the sea, but so swift that an adverse wind beyond a certain point will reduce any but the fastest aeroplanes to the position of not being able to achieve any useful speed over the surface of the globe. I assume, in saying this, that the average speed of commercial flying will probably not exceed much over 80 m.p.h. for some time to come. It will never pay to fly for money-earning purposes a mile an hour faster or a foot higher in altitude than can be proved to be financially worth while. Wind currents will therefore be of supreme importance to air

* Paper read before the Aeronautical Society on June 21st, 1917.

transport companies. As 40 to 50 mile winds are not uncommon in the upper air in the temperate zones, while 30-mile winds are still more frequent, it follows that it may pay to go many miles out of the direct route, geographically speaking, to secure favourable currents. It is an interesting fact, therefore, that in many cases we know already of the existence of well-defined and persistent air currents which will be of great assistance to world navigation. Another way of emphasising this point is to realise that a continuous 3-mile current in the open sea is uncommon, most regular ocean currents not exceeding more than one-half this speed. Even a 3-mile current would only make a difference to a ship of 72 miles in 24 hours. Yet most courses for ships are laid out to avoid or to use such currents. In the case of flying, even a favourable 30-mile wind would add 720 miles to the day's run, while a head wind of a like speed would take 720 miles off the distance covered. In other words, there would be 1,440 miles difference in every 24 hours between a 30-mile wind favourable to the course of the aeroplane and a 30-mile wind against it—a difference so great as to make longer mileage a matter of comparative indifference. What this may mean I have only to state that it is about 1,800 miles from a point in County Kerry in Ireland to St. John's, Newfoundland. Assuming that an aeroplane started from St. John's with a 30-mile westerly wind behind it, and was capable itself of a speed of 80 m.p.h., the combined speed of 110 m.p.h. over the surface of the globe would mean that in about 16½ hours after leaving St. John's the seaplane or aeroplane could alight on the coast of Ireland. With a contrary wind of 30 m.p.h. the speed of the seaplane would

The World's Air Routes and their Regulation.

be reduced to 50 m.p.h. over the earth's surface, and the journey would take 36 hours instead of 16½, or nearly 20 hours longer. Already there exist machines which, by substituting a load of petrol for a load of bombs, could remain in the air over 16 hours, so I am not putting forward an impossible example. It may be advisable, therefore, in some states of the atmosphere to fly to the North American Continent *via* Iceland and Greenland; in other states of the atmosphere *via* France, Spain, Portugal and the Azores. The reasons for these circuitous routes will be seen in some diagrams which I shall show you. It is clear, therefore, that meteorology and the study of wind currents is going to be of supreme importance. The knowledge of the world's atmospheric conditions and accurate forecasts, apart from their inherent scientific interest, may affect the saving or spending of millions of money annually, when postal and commercial aviation is established.

The Organisation of Routes.

It is probable that the first great world routes to be regularly organised will be those over land, for reasons which I have already mentioned. And it should be remembered that the longer the distance, the more remarkable the saving in time. For instance, you will see on this map two alternative routes to India, and beyond India to Australia and China. Before the war 14 to 15 days was the fastest average time by railway and mail boat to India, and about 30 days to Australia. You will also observe that I have indicated one route which will lead *via* our West African Colonies to the Cape, and another which, following the Nile, would lead to the Sudan, British East Africa, Rhodesia and Natal. In the northern or land route to and from the East I have assumed that some international arrangement will be come to by which the air above a certain level will be internationalised, following the well-established parallel of the 3-mile limit round the coast. On this route you will see that five independent countries are involved besides British territory—Afghanistan, Russia, Austria-Hungary, Germany and Holland. The distance from London to Peshawar by this route is about 3,600 miles, and from Australia about 7,000 miles. The other Eastern route, which for purposes of identification I call the All Red Route, passes wholly over the sea and over the land of the British Empire and the 3-mile sea fringe round it. It might, however, be convenient to arrange landing places with our Allies France and Portugal for the route to Gibraltar, and with France and Italy in regard to more distant landing places in Algeria, Tunis and Tripoli. The route to the East by sea *via* Gibraltar is 1,600 miles longer than that which takes the more northerly course, being about 5,200 miles as against 3,600 miles. I do not believe continuous flying by night and day will be popular or practical for many years to come, so I allow in all my calculations for passenger services for two periods of flying every day of 600 miles each, or 10 hours in all, which, at 120 m.p.h., would give the reasonable distance of 1,200 miles covered between dawn and sunset. I think a rest by night will be more popular than a continuance of the journey in the dark. Then, as now, the wonderful views of the earth beneath will be one of the greatest inducements to fly by day. Mails, on the other hand, will probably proceed continuously, but except in the most urgent cases passengers will, I think, be content to travel in the immensely shortened time which would be occupied, say, in getting from London to India or Australia or South Africa. The saving would amount in the case of India to at least 11 days, and in the case of Australia 23 or 24 days. As the world becomes more luxurious again there will be few, apart from enthusiasts, who will care to face the discomforts of eating, drinking, sleeping and performing other necessities of civilised human life in what must necessarily be a cramped space.

I am of opinion also that the pilots will have regularly defined stages like engine drivers on locomotives have their definite stages on long distance journeys. For instance, the train taking you to Edinburgh or Glasgow from London is ordinarily drawn by one locomotive from London to Crewe, by a second from Crewe to Carlisle, and by a third from Carlisle to Edinburgh or Glasgow, the distance of 400 miles being thus broken up into three stages. Similarly, the average pilot will be unable to remain entirely alert and efficient after the strain of, say, six hours hard flying, even if he has an assistant. In addition, to know the peculiar weather conditions of any 600-mile stage across the planet's surface, the local liabilities to storms and the prevailing air currents at different times of the year will need special study in each section. I assume, therefore, that world flying, as far as passenger services are concerned, will be arranged by stages and not be continuous. There are, of course, some oversea routes on which no intermediate stops will be possible, except in fine weather or in conjunction with areas of the ocean artificially protected and made suitable for landing by oil, baulks of timber or grass mats on a large scale to abate and subdue heavy and breaking waves. By the Southern Atlantic route to North America the 1,200 miles of the first stage to the Azores *via* Portugal will be covered comfortably in one day under ordinary circumstances, and rest secured that night; while from there the second day's flight on to St. John's, Newfoundland, will form another quite possible daylight stage. The meteorological importance of the Azores will be referred to later.

In the case of postal communication, the cases containing mail matter will, no doubt, be made trans-shipable, or rather trans-planable, to save time and trouble in transferring them at the beginning and end of stages.

Assuming, therefore, the stage-by-stage system, I set out here a time-table of the two routes to India and beyond from Peshawar and Karachi respectively to London.

I.—Southern Route to India.

Miles.	FIRST DAY.		Time.
—	Croydon (London)	dep.	7 a.m.
625	Marseilles	arr.	12.30 noon.
		dep.	1.30 p.m.
485	Naples	arr.	6 p.m.
1,110			

SECOND DAY.

—	Naples	dep.	7 a.m.
640	West Coast of Crete	arr.	12.15 noon.
		dep.	1.15 p.m.
485	Alexandria	arr.	5.45 p.m.
1,125			

THIRD DAY.

—	Alexandria	dep.	7 a.m.
580	Jof	arr.	12 noon.
		dep.	1 p.m.
460	Basra	arr.	5 p.m.
1,040			

FOURTH DAY.

—	Basra		7 a.m.
575	Bandar Abbas ..	arr.	12 noon.
		dep.	1 p.m.
680	Karachi	arr.	6.30 p.m.
1,255			

Total distance, 4,530 miles.
39 hours 15 minutes actual flying time.
83 hours 30 minutes total time on journey.

II.—Northern Route from India.

FIRST DAY.

—	Peshawar	dep.	7 a.m.
600	Bokhara	arr.	12 noon.
		dep.	1 p.m.
620	Gurieff (Caspian Sea) ..	arr.	6.15 p.m.
1,220			

SECOND DAY.

—	Gurieff	dep.	7 a.m.
600	Lugansk	arr.	12 noon.
		dep.	1 p.m.
610	Tarnopol	arr.	6 p.m.
1,210			

THIRD DAY.

—	Tarnopol	dep.	7 a.m.
600	Leipzig	arr.	12 noon.
		dep.	1 p.m.
600	Hendon (London)	arr.	6 p.m.
1,200			

Total distance, 3,630 miles.
30 hours 15 minutes actual flying time.
59 hours total time on journey.

Separation of Traffic in "Levels."

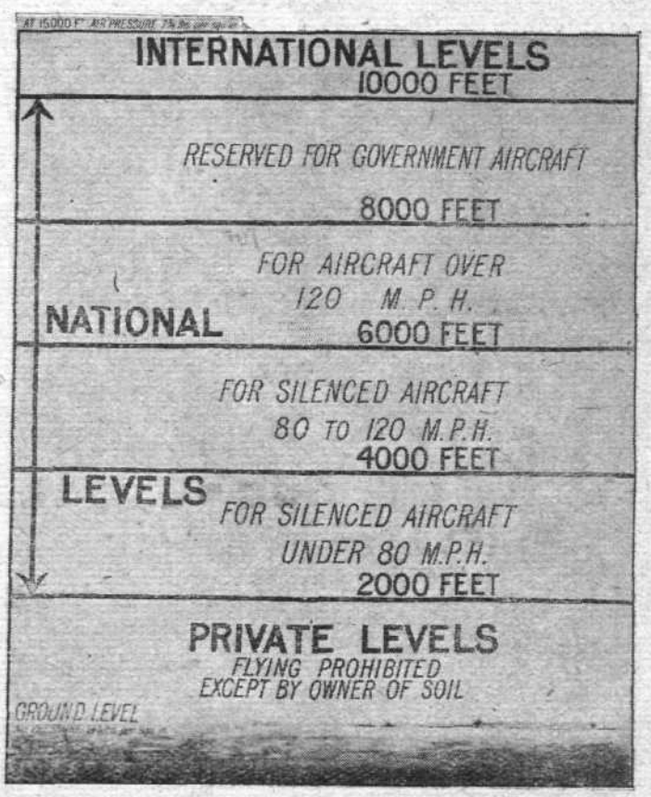
Now we come to the point at which we must enquire how flying round the world is to be regulated; how the principal lines of traffic are to be defined; the methods of constructing the principal aerodromes, which I will call "dromes" for short; the landing places for safety purposes. In considering these problems, it must be remembered that we have the third dimension to help us, that is, height and depth as well as length and breadth. Air traffic will present features similar to those on both land and sea, in addition to marked new possibilities peculiar to the air.

The general principle which I think should underlie all regulation of air traffic is, that slow-speed planes should use the lower levels and high-speed planes the upper levels of the air. You will see on this diagram five levels, stretching from the earth's surface up to 10,000 ft., through which I suggest the various kinds of traffic should be classified to pass. The first 2,000 ft. from the surface of the ground upwards should be prohibited to air traffic in general, but be usable, of course, by the private owner of the soil if he desires, and for the purposes of descending to his own landing or to "dromes" or intermediate safety landing places. This must be so, for aeroplanes will probably form one of our commonest means of locomotion in a few years' time, and provision must be made for all traffic to land at intervals of, say, 10 or 15 miles on defined routes.

In admitting the claims that any air should be private, I conform, to some extent, to the present law of *usque ad cælum*, but I propose to limit that right to an altitude of 2,000 ft. Owners of houses and land, and the dwellers upon and in them, have a moral and probably a valid legal claim to be secured some privacy from nuisances arising from air traffic. Apart from noise, there may be the danger of voluntary or involuntary descents. When flying becomes general everywhere, without some such regulation no privacy will exist for anyone except in lonely lands or dense forests.

Above this private level we come to the commercial levels, which I propose shall range from 2,000 ft. to 4,000 ft. I place this class of traffic on the lowest of the flying levels, on account of the fact that commerce will want to operate as cheaply as possible, and to achieve height and speed means extra expenditure of motor spirit, whichever way it is looked at. And I would make this 2,000 to 4,000 ft. level usable by silenced planes only with a maximum speed of 80 m.p.h.

Above these commercial levels I propose another zone of 2,000 ft., 4,000 ft. to 6,000 ft. for planes, also silenced, capable of speeds between 80 and 120 m.p.h. This will include the general air traffic of the planet for ordinary flying, including a proportion of fast commercial flying. As all aeroplanes will shortly be fitted with superchargers, or their engines designed and built for high altitudes, high flying will become quite easy. At present the decreasing density of the air at heights, leading to falling off in engine power, is a disadvantage. This will shortly be neutralised so that the engine produces the same or even greater power at a height than at the earth's surface. There is, of course, a height where human health and comfort will be affected owing to the effects on the blood of decreased atmospheric pressure, such as what is called "fizzing," and the chance of faintness and heart attacks when a rapid descent takes place. The intense cold also at high altitudes will tend to keep passenger traffic, as a rule, in the lower levels, for there is a decrease of about 5° F. for every 1,000 ft. of height. Above 6,000 to



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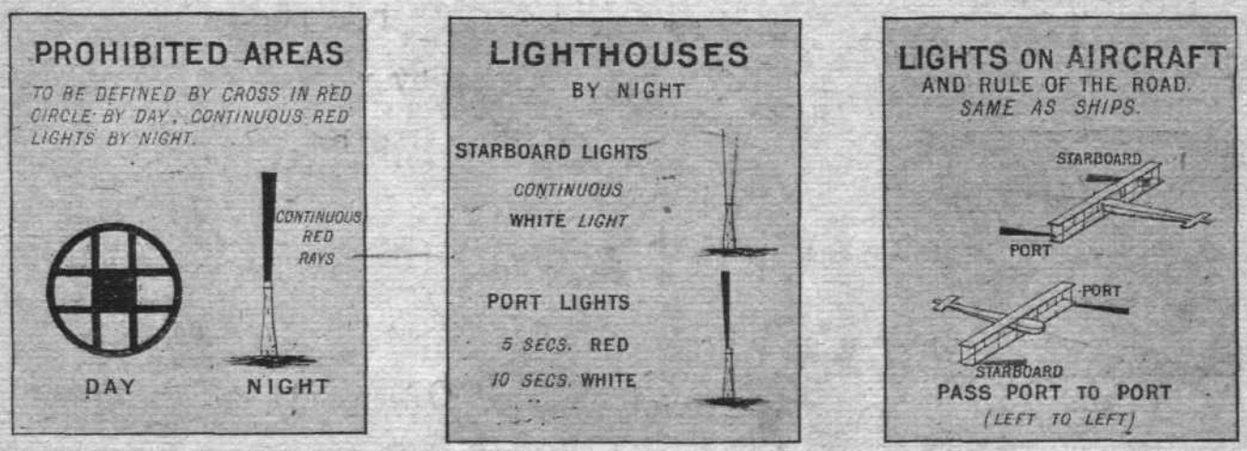
10,000 ft. I would reserve the levels for the official planes of each nation. These levels would be used by its naval, military and civil forces, and by police planes, for air police will be needed in the same way that policing of routes by land and sea is now necessary. Specially authorised pilots—and, perhaps, postal services—will also use the 6,000 to the 10,000 ft. levels, where the international levels will begin. I would remark here that unless we are to have lawlessness and anarchy in the regions of the air, there must be efficient control—this is an axiom of efficiency and civilisation. Control of the levels can only be exercised, nationally and internationally, by police pilots on fast planes above the ordinary traffic, where, with the forces of gravity to aid, they can descend with a superior swiftness upon malefactors and breakers of the air, take their numbers or compel them to alight at the nearest landing place or drome. There must also be no unsilenced machines regularly operating below 8,000 ft.—I am not sure whether that limit is high enough—for even above that height the noise of many open exhausts and the hum of many propellers may become a continuous and nerve-racking nuisance. A serious amount of unpopularity and agitation against the use of unsilenced planes will have to be faced before long. Those of us who remember

the hostile agitations against the use of cars in the early days of motoring—against dust-raising, noise and smell—are not disposed to treat lightly the possibilities of nuisances that must certainly arise from the use of thousands of aeroplanes flying low and unsilenced by night and day.

Now we come to the levels above 10,000 ft., which I propose should be internationalised. The upper air should, I think, be free to all, under certain regulations, provided pilots comply with certain rules for meeting and overtaking, and their craft passed as airworthy—let us say, registered as A1 in a Lloyd's aerial register. This would follow the precedent, which has worked well, of the 3-mile limit at sea open to all ships of all nations. Great altitudes will impose upon ordinary flying some disadvantages which will tend to keep international flying overland and oversea near the 10,000 ft. limit, and flying at these levels will probably, so far as international flying is concerned, be conducted along routes to be defined by methods to which I will allude presently, and in some cases nations may agree to admit international traffic to its own levels. But if a particularly cantankerous nation objects to admit any traffic to the lower levels below 10,000 ft., the air routes will not be altogether barred. It is clear also that there will be prohibited areas, naval and military centres, and flying over thickly-populated districts will probably be avoided on account of a certain risk to those who are still content to crawl about on the earth. But, of course, this will not preclude, as I have said, the air liners of different countries using the lower levels when necessary under licence from the countries over which they pass. Then postal and passenger services may sometimes be driven down to lower levels owing to stress of weather. Aircraft desiring to leave their own levels will, of course, use their wireless to ask for permission from national or international flying authorities. But in this case they should conform, at least so I think, to the rules for silence and any other restrictions which may be found necessary in the lower levels to ensure the peaceful enjoyment of the earth's surface by its inhabitants. The problem of how to secure law and order on oversea routes is more difficult, and for this purpose it seems to me that we shall have eventually to define the paths to be followed within, say, certain degrees of latitude and longitude. It is here again that international control will be necessary, and this control must be backed by international force in the shape of air police, for without force behind them conventions and international arrangements are as futile as the resolutions of the Hague Convention have proved to be. It may be, therefore, that flying over the sea outside the 3-mile limit will become a question of routes outward and homeward with no exactly defined air levels or a fewer number of levels, for there are no inhabitants to annoy over the wide spaces of the ocean, and no one to kill or annoy barring the very remote risk to those few human beings who still will be navigating the sea in ships, probably submersibles by then.



The World's Air Routes and their Regulation.

How Routes may be Defined.

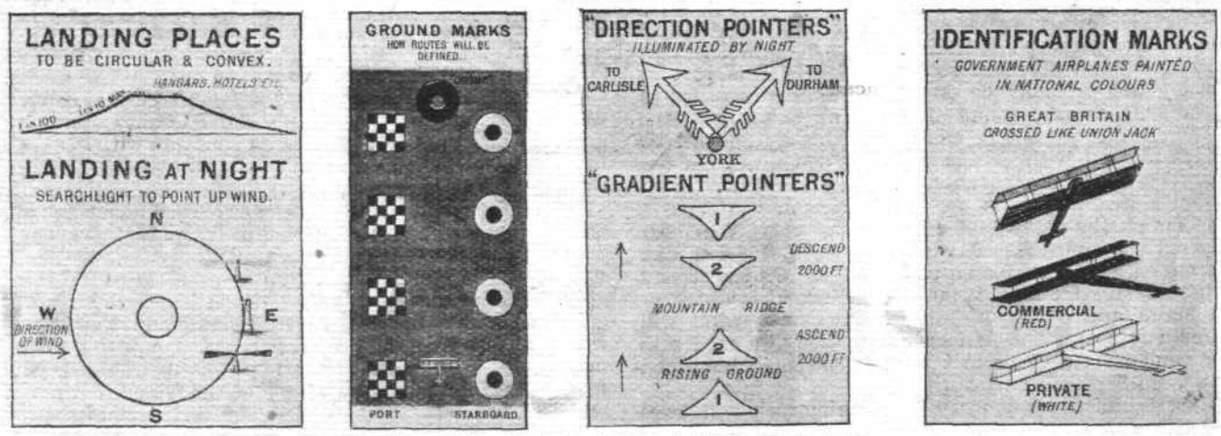
I now come to the question of how the routes chosen over continents are to be defined and traffic guided by night and by day; also how landing places are to be constructed and defined. Here, again, I think we may follow the long and proved experience of the sea. It happens that we possess a more or less agreed code of buoys and marks for defining channels, which I suggest should be imitated in the matter of the air. On the right hand, or starboard, side of all routes from the West to East, the direction in which the earth turns, there should be round marks—a white ring containing a black centre. Routes emanating from westerly points would be those whose general trend is between north and south on the westerly side of the compass. To take, for example, the routes from America to Ireland, Great Britain to Russia or India, Japan to Alaska or British Columbia, Brazil to the West Coast of Africa—on these the starboard or right hand marks on land and sea alike will be white circles with a black centre, while on the left or port side would be checker marks as shown here, square in shape. At sea a system of large buoys may be necessary, where the depths of the sea is not too great for anchorages. And these marks, I may observe, will have to be of considerable size, probably at least 100 yards in diameter, for at 10,000 ft. these will appear mere dots on the earth's surface. At night routes may be defined, as you see on these diagrams, by a continuous white light on the right or starboard side, and red and white alternating lights on the left or port side. These international and national routes between countries, parts of a country and continents, should be of a minimum width of 5 miles, and in some cases a space of 10 miles may be a more suitable width when the air eventually becomes crowded. But that time is some way off. Dromes and landing places may have to be convex and circular, on the plan shown in the diagram. The advantage of this will be that every aeroplane alighting will have, running uphill, the force of gravity to arrest its motion, and when starting off again the force of gravity will equally help to give it speed to rise from the ground. At night the principal light which will illuminate these special places will, of course, show its rays up wind, so that the pilot who is obliged to land against wind will have the light at his back and not at his face when making his landing. There must also be lights denoting the starboard and port sides, smaller green and red lights on each side of the portion of the ground on which landing is advisable. All these lights should be movable, and be placed on trucks on rails laid down round the circumference of the landing ground, so that they can be moved as the wind shifts from one quarter to another, and in the daytime they can be used in conjunction with indication marks to achieve the same purpose. Let us take as an example the route from London to the north of England and Scotland. On account of the less windy character of the east as compared with the west coast, the route would probably follow to some extent the Great Northern Railway. It would divide somewhere on the borders of Durham, near Scotch Corner, whence the Glasgow route would take a north-westerly direction, over by Brough, Carlisle and the Nith Valley; while that to Edinburgh would continue straight on by Newcastle, and thence either by Berwick under the lee of the Cheviots in the westerly winds which largely predominate in these latitudes or up Redesdale over the Carter Fell. These different routes would be indicated by large white arrows on the ground with, perhaps, the initial letter letter E or G to say in which direction the routes were proceeded. At night such arrows would be illuminated.

The marks and lighthouses could be at intervals of 10 miles alternately each side, or 20 miles apart on the same side, as shown on the diagram; and in the case of fogs these lighthouses will help, like those concerned in navigation by sea, with wireless telegraphy and toned fog horns. There will also be assistance given by at least two new and very recent developments of wireless telegraphy, by which direction of bodies in motion can be accurately ascertained by the

helmsmen or pilots, and their position in regard to fixed points on sea, land or in the air, easily ascertained. I cannot at the present moment give any more precise indications at present of these new developments, which promise to be of the greatest assistance in the navigation of the air in the future. In fact, when perfected they will deprive night fog and cloud of most of their dangers. Over the sea lightships will be usable with the same code of lights always turned upwards. There may also be on land small captive balloons at moderate altitudes illuminated at night to indicate locality to the upper levels.

Gradient Pointers.

Now we come to some minor, but still important, points, such as to how mountains are to be surmounted. You will remember that I expressly mentioned that the "levels" should be measured from the surface of the planet, not from sea-level calculations. It follows, therefore, that when you have to cross passes through mountains, such as the Himalayas, Alps, Pyrenees, or, to come nearer home, to fly over such mere pimples in comparison as the Pennine Range, the Cheviots or the Grampians, there will have to be some signs to show that you are nearing "rocks." To indicate rises in the ground underneath, I suggest signs similar to those I show you in these diagrams. Of course, to save motor spirit (probably distilled by then from coal direct, and no longer petrol), the lowest passes through mountain chains will be selected. The world's traffic lanes will, therefore, not be at the same altitude all over the world reckoning from the sea-level. They will vary except over flat countries. Let us take an instance near home, the nearest route from Newcastle to Edinburgh—over Carter Fell into Scotland—will



The World's Air Routes and their Regulation.

which I attended on behalf of Great Britain some ten years ago in Paris, and which allotted to each country specified lettering—GB standing for Great Britain, F for France and D for Germany. Pilot certificates granted by responsible countries will be recognised as valid by all those countries which signify their adherence to an international agreement, in the same way as motor drivers' licences are now recognised everywhere.

Weather and Wind all-important.

Almost the most important of the subjects which will have to be considered in relation to the world's air routes is how weather and wind conditions will affect flying over the surface of this planet. The prevalence of trade winds is known to you all, and how they blow with unvarying regularity and strength in certain directions in certain seasons. But what is less generally known is the almost permanent existence of areas of high barometrical pressure (sometimes called anti-cyclonic systems) in different parts of the world. These systems, though they contract and expand, have a more or less continuous effect upon the weather and winds of the world. I have not space to deal at length with this interesting subject, worthy of a separate lecture altogether, except as regards some special features over Europe, Western Asia and Northern Africa. Before these charts of pressure and winds can be properly understood there are two points that must be grasped: Firstly, that wind always blows parallel to the lines of the isobars, that is, the lines of equal pressure; and, secondly, that the circulation of the wind is clockwise in high-pressure or anti-cyclonic areas, and anti-clockwise in low-pressure or cyclonic areas. This is known as the Buys Ballot Law, which in the southern hemisphere equally applies in an opposite sense. Now you will observe that the weather of Western Europe, with which we are mostly concerned, is largely governed by two factors—the tendency to a low-pressure trough more or less all the year round between Greenland and Iceland, and the high-pressure area, which is permanent, though varying in area near the Azores. It is the combination of these two areas which produces the great preponderance of westerly and south-westerly winds over these islands and the Eastern Atlantic. There is another seasonal high-pressure area in the Sahara over North Africa, between the West Coast and the Sudan, during the winter time, as has just been proved by Major Lyons, the President of the Royal Meteorological Society, in a recent paper. Then there is a nearly constant area of high pressure north of the Himalayas, over Southern Siberia and Turkestan. The low-pressure systems in the European and Western Asian areas are more seasonal and variable in character. There is a trough of low pressure, which lies between the Persian Gulf and the Western Himalayas, between May and October, which is the origin of the south-west monsoon so strongly felt in the Arabian Sea and over the western and northern parts of India. Then, nearer home, there is another area of low pressure generally prevalent over the Adriatic, the Northern Mediterranean and the Balkan States, which is characteristic rather of the winter than the summer months, producing a tendency to westerly winds in the Mediterranean and corresponding easterly winds to the northwards of the Carpathians. Now, these systems and the consequent tendencies to a permanent direction of wind either all the year round or at certain well-defined seasons, have a most important bearing on the world's air routes. And the lesson to be drawn is

necessitate a rise of just under 1,600 ft. Without proper warning, and on a misty day or dark night, an aeroplane flying to the east of the point where the border is crossed might collide with the Great Cheviot, which is nearly 3,000 ft. high, or nearly touch Carter Fell itself to the west of the pass. There must be, therefore, indications of gradients similar to the gradient posts of railways. You will see in the diagrams how I propose that ascending and descending gradients should be made clear. These would be white patches by day and their outlines illuminated by night. Then you may legitimately ask at what level will your need for higher altitudes for your levels begin. I suggest that all altitudes from sea-level to 250 ft. should be considered as negligible. Above that every 250 ft. will be indicated by large figures giving the average altitude of the ground below —500, 750, 1,000 and so on. It will be desirable, in planning regular routes, to avoid isolated high hills or groups of hills small in area, such as Hindhead or the Malvern Hills. All routes will follow so far as possible flat country for meteorological reasons as well as I shall show presently.

How Aircraft should be made Identifiable.

Now I come to the problem of how planes shall be designated and made identifiable. First of all there will be the nationally-arranged colours of each country for those engaged in official services. Then I propose that all private planes shall be white and commercial planes red, to distinguish them the one from the other. All planes, official and private, will be lettered and numbered, as decided by some international conference, such as that which settled for all countries the regulations for international motor car touring,

that, instead of abusing the wind, we can use it. We can follow the main currents instead of fighting against them, and then we shall find them our friends. For instance, the route homewards from India during the greater part of the year will be far easier through Afghanistan, Russia, Germany, and by what I may call the northern route, than by a more southern course, for easterly winds or calms predominate. On the outward or eastward journey, however, the route is across France, by the Rhone Valley, where the wind is often north-westerly, sometimes called the "Mistral," to Marseilles, whence we shall go either across the Lower Alps to Italy, and follow the coast to the heel of Italy. Or we shall fly *via* Sardinia to Malta, whence by Tunis we get to Egypt. The alternative routes will be from Brindisi to Alexandria direct about 900 miles, or from Taranto to Malta. Thus the eastward and westward routes to India, the Central European and Mediterranean, may be spread apart by 1,000 miles at their extreme point of divergence, and yet be the quickest routes and the cheapest to fly. In fact, wind will matter far more than mileage. In former days the trade winds dictated just the same sort of courses for sailing ships, and often the outward and homeward routes were half an ocean apart. So it will be in future.

Eastern Routes as affected by Winds.

Now let us take the outward Eastern route in detail and see how the winds will help on an average winter day. Starting, say, from Hendon or, perhaps, Croydon—for I assume that two great starting and landing places will exist for northern and southern routes to and from London—in the first flight Marseilles will be reached, where a descent for lunch will be made, the 600 miles—I give round figures—having been covered in about five to six hours. This portion of the route will be affected on about 80 per cent. of the days of the year, first by westerly and later by north-westerly winds, that is, either cross or negative and favourable currents. Next, some point near Taranto or Brindisi or at Malta itself will be the next stopping place. This part of the journey will probably be done by seaplane in order to avoid the longer route round the Bay of Genoa and the leg of Italy. The prevailing wind over this section will be north-west to start with, and afterwards light airs from the south-westward will be encountered. The "mistral" often extends in a modified form on many days in winter to a point as far as the south end of Sardinia, where the most westerly current supersedes it. The winds on the first day will, therefore, be favourable on the average. On the second day, whether we start from Brindisi for Alexandria direct or fly *via* Malta and Tunis or Tripoli, a westerly wind will prevail as a rule near the African coast, though a moderate easterly wind is sometimes met with in the neighbourhood of Malta from September to April.

On this second day's journey by evening you will have reached either some point between Malta and Alexandria on the Tripoli coast, or more likely Alexandria itself, only 850 miles from Malta. Egypt is situated in a region where calms or light winds predominate, with the exception of the disagreeable sand-laden "Khamseen," the strong westerly wind from the desert, which, however, is favourable to progress eastwards.

We then proceed eastwards over the Arabian desert, where calms and light winds are the rule, a state of atmosphere which prevails all the way to Karachi, except in the monsoon period, when the north-west wind is also in our favour. In the Persian Gulf the isobars for the greater part of the year show a prevalence of north-westerly currents, also favourable. At Karachi in the winter, during the day, wind of considerable strength from the south-west is produced by the great difference of temperature between the Arabian Sea and the heated areas of the Sind desert behind it. Flying on south-eastward towards Bombay or north-eastward towards Delhi, there is no decided unfavourable current on the average. Thus we trace step by step, or rather anti-cyclone by anti-cyclone, isobar by isobar, the outward route to India.

I have not time to examine in detail all possible routes, but on the homeward passage, the reverse side of these winds, favourable for flying eastward, is available. Every weather system, as I have explained, has a circular movement. There is no doubt about the prevalence of easterly and south-easterly winds throughout the monsoon period, lasting from the middle of May to the end of October, in all the country we should use for our westward journeys, through Afghanistan and through the neighbourhood of the Aral and Caspian Seas. Our first day's journey homeward takes us to Gurieff, following the average isobars. And once the corner of the Hindu Kush has been crossed at about 5,800 ft., the country all the way to England is marvellously flat, which favours the absence of wind. I would remark here that absence of strong winds is a feature of inland flat countries, while mountain chains, especially when high and snow covered, are specially liable to storms owing to the sharp changes of temperature producing local winds of considerable force.

The next day we leave the head of the Caspian Sea, and arrive *via* Lugansk at Tarnopol near Lemberg. Here, again, we leave the mountain systems of the Caucasus, the Balkans, and the Carpathians to the south of our route. The next and third day we have to face the chances of westerly winds against us when approaching the North Sea and Channel, which, however, lose much of their force inland. From these, however, there will be no escape, except when an anti-cyclonic system exists over Scandinavia—a not uncommon winter and spring feature—which will give us easterly or north-easterly winds over Western Germany and Holland.

The Wind our Friend.

After the detailed consideration of these two Eastern routes you will grasp the point at which I have been driving, namely, that the wind systems of the world can probably be made to serve the purposes of flying exceedingly well, and that, instead of winds being a disadvantage to flying as might at first be thought, they will assist us if properly understood. In fact, the existence of alternate high and low-pressure areas, with their respective and regular circulations of wind, will define far more than geographical conditions the chief air routes of the world.

Of course, there will be special atmospheric conditions from time to time which will involve alteration from the average courses recommended for over-sea and over-continental flying. There may be, to take a common instance in summer, an extensive "low" over France or over the mouth of the Channel involving strong easterly winds blowing from our western shores far out into the Atlantic to a point at which the Azores "high" is joined up with another "high" near the Atlantic coast. In such a case a seaplane could, with the probability of a favourable wind over the greater part of the passage, fly from County Kerry to St. John's, Newfoundland, in a shorter time and with less expenditure of petrol than by any other route. And in flying westward you will be sun-chasing. In our English latitudes of 51 to 55 the earth's motion does not exceed about 650 m.p.h., and though we shall not be able to fly quite fast enough yet round the planet to keep the sun over our heads continuously, still at 120 m.p.h. we shall lengthen our day very considerably. In the case of crossing the Atlantic there will be a gain of about 4 hours between Ireland and Newfoundland, which means that, leaving Ireland at 7 a.m. on a summer morning, if an average of 110 m.p.h. is maintained, you will reach St. John's in 16½ hours actual elapsed time, from which four hours must be deducted in point of solar time. Thus you will leave Ireland after breakfast at 7 a.m. and reach Newfoundland at 7.30 p.m. by local time, in time for dinner. Coming eastward, your daylight, alas! will be shortened by the same time, and, except in the summer months, a start before dawn or an arrival after sunset will be inevitable.

But to return to the consideration of a western route as affected by weather conditions. Assuming again an extensive "low" situated between the west coasts of Scotland and Iceland, a common winter type of weather, while the Azores "high" has extended some way up the Bay of Biscay, then the passage to America may be more advisable by the Azores than by any more northern route. With wireless stations specially instituted for this purpose over the world's surface, and ships stationed at intervals over the sea to send wireless messages as to weather conditions, our forecasts and weather charts of the future compared with those of to-day, good as they are, will be extraordinarily accurate, and be absolutely reliable except in the case of very suddenly formed small depressions local in their influence.

I would mention before I leave the subject of the winds, that along the line of the equator there is a tendency to an easterly wind, sometimes north-east, sometimes south-east, at all times of the year. This tendency also will be useful.

I cannot deal on the present occasion with other weather conditions such as fog, except to mention that fog exists chiefly in certain latitudes, and generally coincides with calm weather, or, at any rate, very light winds. Rain, snow and hail I disregard, for they will be negligible to the planes of the future, though large hailstones may be harmful to propellers or even wings; but hailstorms are local, as a rule, and can be avoided. The ability also of aeroplanes to avoid or rise to a height above local disturbances will be the solution of many of these difficulties, for heavy precipitation, generally speaking, arises in levels lower than 10,000 ft.

A General Law for Flying.

Applying the results of the Buy Ballot law, we arrive at another proposition, which will be accepted by meteorologists, that when the weather at any spot in the Northern Hemisphere is under the influence of low-pressure areas, and if the passage of the centres is near the place from which the pilot is flying westwards, he will start on a northerly course at first. In like manner, when he desires to fly in an easterly direction he will take a southerly course to start with. If, on the other hand, the weather is under the influence of a high-pressure area, these rules will be exactly reversed. To give an illustration. If a large and intense anti-cyclone were to exist between England and the Alps, eastward-bound pilots would fly first of all over the North Sea and take a line eastwards through Western Russia, whereas, if westward bound from Egypt homewards, wise pilots would keep well to the south of the Alps before turning in a northerly direction to England.

There is another point which every experienced pilot is aware of, but which is not generally known to the public. The higher you fly the more the wind tends to turn to the right. That is to say, if on the ground you find a westerly wind, the wind at 5,000 ft. will probably be W.N.W., and at 10,000 ft. probably N.W. The cause of this is found in the rotation of the earth, but I cannot dilate on this here. I must also mention that isobars on the earth's surface are not the same necessarily as those several thousand feet up in the air.

Now I come to the conclusion of my lecture, and I desire to summarise the principal points.

Three Points of Importance.

Firstly.—As soon as war is over there must be national and international laws for the regulation of flying.

Secondly.—Over-sea and over-continental routes must be defined in the interests of the whole world.

Thirdly.—The winds of the world, instead of being a drawback to flying over the surface of the planet, will, if properly used, proved to be of great assistance.

Life and Money Spent on Aviation not Wasted.

The progress of aviation, owing to its immense and increasing importance in the war for naval and military purposes, has been extraordinarily rapid during the last three years. The decisive military and naval results which a real preponderance of air power would bring about are at last beginning to be realised—I hope not too late. Nations are spending millions of money upon the development of flying, and thousands of brave men have sacrificed their lives, both in fighting and experimental work. There has been a prodigal expenditure of life and treasure and a wonderful concentration of brains and energy on aviation for destroying human life and wrecking property. But when peace once more comes this output of human life and skill will prove not unproductive. Unlike the expenditure of all kinds in producing forts, battleships, guns, shells, powder, missiles, gas and horrible and ingenious ways of killing, resulting in nothing useful to the human race in future, the forced development of aviation will, perhaps, be the war's most useful legacy, apart from political effects, such as the welding together of the British Empire by the cement of blood.

And so I give you this thought to take home with you to-night, that the lives of our brave youth given to save us when our very existence is at stake, will not have been wasted. The great development of flying produced by this war will mean that in a few years from now the human race will navigate the air with ease, speed and safety. And we who are alive to-day, and for a few years longer, should consider ourselves fortunate to be living in the most wonderful time in the world's history.

As an addendum to Lord Montagu's paper on the World's Air Routes and their regulation, the following few dates dealing with past aerial legislation were given as a guide:—

The first Act of Parliament in regard to the regulation of aviation was passed on June 2nd, 1911, and provided for the protection of the public against dangers arising from the navigation of aircraft. The first two sections give power to the Secretary of State to prohibit the navigation of aircraft over prohibited areas, and to inflict penalties for offences.

The second Act of Parliament was passed on February 14th, 1913, amending the Aerial Navigation Act of 1911 which has already been referred to. This second Act extends the power to a Secretary of State further to regulate aircraft. It was according to this Act that drastic powers were given "to fire at or into such aircraft and to use any and every other means necessary to compel compliance."

As we now know, the anti-aircraft guns of those days were so feeble and inadequate that this apparently terrifying sentence might have been ignored with perfect safety by any machine capable of rising to over 5,000 ft. Perhaps, however, like many regulations of the kind made by Government Departments, the object was to frighten and not to hurt.

Various statutory rules were eventually made under this Act, including the prohibition of aircraft, coming from any place outside to the United Kingdom and coming over the territorial waters adjacent thereto, certain exceptions being made.

It is interesting to note that in these statutory rules, Orders Nos. 228 and 243, one of the paragraphs begins: "The person in charge of an *airship*, before commencing a voyage to the United Kingdom," whether this was intended to imply that no aeroplane was likely to cross the Channel—which, I may remind you, was first crossed by Blériot on July 27, 1909—or not I do not know. The use of the word "airship" is interesting, however, as illustrating the belief in the official mind at that time that it was the airship and not the aeroplane against which this country had to guard itself. The list of the areas prohibited was very full, and included railway stations, dockyards, churches, farms, piers, islands, breakwaters, and forts.

Other statutory rules and orders were published in 1914, Nos. 725, 726 and 1,117, the last one mentioned being published only two days before the outbreak of war on August 2nd, 1914.

The Crew of the "Z. 48."

ON June 20th the final scenes so far as the dead crew of the destroyed Zeppelin "Z. 48" were concerned were enacted in a quiet little village near the East Coast, the inquest and funeral following in quick succession. The inquest was held in the open at a farmhouse, where, under the shade of the shrubbery, the jury of eight, military and police gathered. It took place with guns rumbling in the distance, and aeroplanes soaring overhead. The Coroner at the outset intimated that the jury had to ascertain the cause of death of 14 bodies.

The first witness, a R.A.M.C. major, said of the 14 bodies he had been able to indentify five, all of which were lying in a field outside the area enclosed by the military. No. 1 was apparently that of a man named Surklepp, this being the name on his identification disc. The only other marks were 1138 M.L.A. 1843.

In the five cases the cause of death was injuries through falling; all of them had bones broken and heads smashed. There was no evidence of burning. The other nine bodies were all badly charred, and the cause of death was burning.

The parish police constable said a quarter of an hour after he had at first espied the Zeppelin he sighted an aeroplane approaching from the south-west. It was circling round and round. Almost immediately the Zeppelin came from the same direction. It appeared to be disabled. At that time another aeroplane appeared, and they both appeared to be attacking the Zeppelin, which was drifting to the north-east seawards. At 3.30 she caught fire.

The district police sergeant deposed to searching the body of the supposed commander. On him he found an iron cross, a gold watch and guard, a revolver, a pocket-book, and some letters in German.

The jury returned a verdict that five of the men died from injuries in falling, and the other nine in burning sustained in the destruction of the Zeppelin.

The bodies were buried on June 20th with military honours in the cemetery of the church near where the airship fell. The procession, comprising four gun carriages and three military wagons, was headed by an officer and accompanied by a squad of cyclists. The coffin which held the commander s body was placed on a bier. An R.F.C. corporal went forward and put on it a choice piece of white bloom, with the inscription, tied with the Flying Corps colours, "To a very brave enemy, from the R.F.C. officers."

The Co nmander of the "Z. 48."

DEPLORING the death of Captain-Lieutenant Franz Georg Eichler, commandant of "Z. 48," destroyed on June 16th–17th, the *Leipziger Neueste Nachrichten* says that Capt.-Lieut. Eichler, who was 40 years old, after serving in the Navy, entered the service of the Hamburg-Amerika Line, was promoted Captain-Lieutenant of that line, and was Captain of the "Imperator" and the "Vaterland." He entered the Officers' Corps of the battleship "König Albert" as artillery officer on the outbreak of war. In May last year he entered the Naval Airship Service, and had participated in a large number of attacks on England. Capt. Viktor Schutze, the leader of the squadron, who perished on the same occasion, was 41 years old, and had been in the Air Service for two years.

Cadets at the R.A.F.

AT a meeting of lads employed at the Royal Aircraft Factory on June 18th, it was decided to form a special R.A.F. company of the 1st Cadet Battalion of the Hampshire Regt. It is proposed in connection with this scheme to organise a sports club and a reading room where indoor games can be carried on in the winter.

Air Work Above Storms.

WRITING from the British Headquarters on June 19th, Reuter's correspondent says :—

"The wonder of it is that during the storms of yesterday our airmen remained up and doing, and actually had one of the best days they have recorded as yet in this new era of their re-asserted supremacy."

Of course, it is a well-known meteorological fact that electric disturbances are usually low lying and that not many thousand feet above the flashing and thundering canopy which was emptying its streams upon the earth lay a gold and blue void into which our airmen could enter when they found an enemy to attack.

Aeroplanes in Italian Offensive.

"IN the fighting for Hill 2105 in the Mount Ortigera region the Italians used over 145 aeroplanes," says a message from the Italian General Headquarters. Of this number "81 were chasing machines, and took part in the aerial operations against the enemy's base and lines of communication, and the plateau. These threw some 400 aerial torpedoes to the weight of some 5½ tons. The fire of the enemy's anti-aircraft guns slightly damaged two of our machines. All the others returned undamaged."

Another Protest by Holland.

THE Dutch Ministry of Foreign Affairs announces that it has charged its Minister in Berlin to make an earnest protest to the German Government against the new violation of Dutch territory by a Zeppelin, which on the 17th inst., without giving signs of distress, flew over northern Dutch provinces, coming from the west, and was fired at by the military at Harlingen and Donderen.

The Queen of Sweden and Karlsruhe.

THE Queen of Sweden, says the *Vossische Zeitung*, on the occasion of the second anniversary of the air attack on Karlsruhe, conveyed her sincere sympathy for the town and the afflicted families in a letter to the Chief Burgomaster. The Queen is a daughter of the Grand Duke of Baden.

Aeroplane Work on Indian Frontier.

IT was officially announced in Simla on June 24th that successful operations have been carried out by the Waziristan Field Force against the Mahsuds. Aeroplanes and bombs played an important part in the fighting. Our troops, who were assisted by a Nepalese contingent, returned to camp after inflicting severe losses on the enemy. Our casualties were light, but included Major Harte, of the 6th Gurkhas, killed.

Italian Aerial Mails.

IT is announced from Italy that the regular aerial postal service from Italy to Sardinia was inaugurated on June 27th, the start being from Civita-vecchia.

Aeroplanes *v.* Submarines.

SEVERAL small coasting vessels have been sunk in Tunisian waters with bombs by German submarines carrying sail. The submarines were attacked by French aeroplanes, and disappeared after firing two shells, which caused no damage.

Zeppelins as Convoys.

A REPORT from the Hook of Holland says that a Zeppelin was seen there on the evening of June 16th coming from the Scheveningen direction. It remained a considerable time hovering near the Hook outside territorial waters. Apparently it intended to accompany four German steamers which left during the evening.

German Admiral Flies.

MESSAGES received in Amsterdam state that on June 24th Admiral von Koester, the president of the German Naval League, who is 73 years of age, went for his first flight in an aeroplane, being taken by a naval pilot over Wilhelmshaven.

PUBLICATION RECEIVED.

The Way of the Air. By Edgar C. Middleton ("An Air Pilot"). London : William Heinemann. Price 2*s.* 6*d.* net.

SIDE-WINDS.

THOSE who own vulcanising plants should note that a new edition of the Dunlop Vulcanising Handbook has been ssued. Copies can be obtained from the Advertising Department, Dunlop Rubber Co., Ltd., Aston Cross, Birmingham.

AMONG recent elections to membership of the Society of British Aircraft Constructors is the Davidson Aviation Co., Ltd.

A LITTLE change to note. The General Aeronautical Co., Ltd., of 30, Regent Street, S.W., announce that their telegraphic address has been altered to "Ridleypren," Piccy, London, and their old address "Santochimo" has been cancelled. The change also affects the British Emaillite Co., Ltd., which uses the same abbreviation for its telegraphic address.

THE fact that the price of linen goods is in no danger of falling, and is, on the contrary, certain to go up, would be sufficient to draw attention to Messrs. Robinson and Cleaver's summer sale, which is now open and will continue during July. There are many bargains offered in the Men's Department which should especially appeal to members of the Flying Services. In many cases the reductions in price are pretty substantial on the prices ruling to-day, so that the sale offers an opportunity to those who study economy to replenish their stock of underwear with goods of a quality for which Messrs. Robinson and Cleaver are famous.

HIS many friends in and out of the industry have been very pleased to hear that Mr. W. Lionel Naylor (director of Naylor Brothers (London), Ltd.), who has been on active service in France since the beginning of the war, has been awarded the Meritorious Service Medal for "valuable services rendered with the Armies on the field."

ALTHOUGH there are difficulties in the way of obtaining leather for certain purposes, it is fortunate that Ferodo fabric is available as a substitute—and a highly efficient substitute. It can be used with every confidence for such purposes as coupling joints, and a user has recently reported that "Ferodo fibre has stood up in joint form very much better than equal thicknesses of best chrome leather." Where little or no flexion is required Ferodo fibre will prove most satisfactory. The makers, The Herbert Frood Co., Ltd., Chapel-en-le-Frith, will be only too pleased to render assistance in solving the problems of any enquirers.

Aeronautical Patents Published.

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26,841. J. VIAL. Apparatus for sighting, and dropping bombs, &c., from aircraft.

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